

**Vol. II**  
**TRANSCRIPT OF RECORD**

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**Supreme Court of the United States**

**OCTOBER TERM, 1939**

**No. 681**

**RAILROAD COMMISSION OF TEXAS ET AL.,  
&  
PETITIONERS,**

**vs.**

**ROWAN & NICOLS OIL COMPANY**

**ON WRIT OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT  
OF APPEALS FOR THE FIFTH CIRCUIT**

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**PETITION FOR CERTIORARI FILED JANUARY 29, 1940.**

**CERTIORARI GRANTED MARCH 11, 1940.**

474 J. S. HUDNALL, a witness for the Respondent,  
having been first duly sworn, testified as follows:

Direct Examination.

Questions by Mr. Hart:

Q. State your name, please, sir.

A. J. S. Hudnall.

Q. Mr. Hudnall, where do you live?

A. Tyler, Texas.

Q. What is your profession or occupation?

A. I am a petroleum geologist.

Q. Mr. Hudnall, what education did you receive to prepare you for that profession?

A. I graduated from the University of Kentucky with a Bachelor of Science degree, had one year's post-graduate work at the School of Mines, Pennsylvania State College and one year's post-graduate work at the University of Chicago. I majored in geology and engineering at all schools.

Q. After you received that schooling state what practical training you had along that line.

A. I started out as an assistant geologist for Kentucky Surveys, which was doing more or less conservation work. My particular duties were to make a structural map of some of the oil fields producing in Kentucky. I worked for that survey about three and a half or four years.

475 Following that I did work for independent operators for about a year. Following that time I went into consulting work and have been doing it continuously ever since then.

Q. In what localities or oil fields have you worked?

A. I have been working during the last fifteen years mostly in Texas, but to some extent in New Mexico, Oklahoma, Arkansas and Louisiana, and occasionally off in some other states in wildcat consulting work, that is, exploration consulting work.

Q. How long have you been located at Tyler, Mr. Hudnall?

A. Since January, 1931.

Q. About what date did the East Texas Oil Field come in?

A. About October 10, 1930. There were about eight or ten wells in the field when I went there.

Q. Have you kept up with the conditions in the East Texas Field since that time?

A. Yes, sir. I have spent some eighty to ninety per cent of my time since that time studying the East Texas Field and keeping up with the developments there.

Q. And will you state to the Court generally, please, what you have done in order to inform yourself about the conditions in the East Texas Field, or what data you have consulted and so forth?

A. The first work that I did in the East Texas Field was to make a plane table survey, that is, a survey on top of the surface of the location of the wells and roads and school houses and all of the physical features on top of the ground. At this time elevations were drawn on some 4,000 wells and logs were collected from these wells and a structural map was made of the entire field. The  
476 first structural contour map was made about May, 1931. Following that I have worked up and revised the structural map essentially every six months to a year ever since that time.

Q. Well, does the picture of the structural map change as new wells are drilled and further information acquired?

A. Yes, sir, the map changes with new completion data. Almost every well on the west side of the field changes the contour some. There are so many wells now that the changes are minor in comparison to what they were back in 1933 and 1934 and 1935.

Q. Mr. Hudnall, have you ever been employed by the Railroad Commission of Texas in connection with work in the East Texas Field?

A. Yes, sir, I have been employed on a consulting basis on several occasions by the Railroad Commission.

Q. Were you ever consulted in connection with the application of the potential method of allocation?

A. Yes, sir, I was asked by the Commission and employed by the Commission to come down at the state-wide hearing prior to the institution of the potential method of allocation, to give my ideas as to how to take potentials and what they would reflect and how they would affect the various operators and various wells in the field.

Q. Are you familiar, then, with the geological facts in connection with the East Texas Field?

A. Yes, sir, I think I am.

Q. Would you state to the Court generally whether the Woodbine section in the East Texas Field is regular or irregular in characteristics throughout the field?

477

A. It is uniformly irregular.

Q. Explain that, please, sir.

A. I mean that throughout the field there is everywhere irregularity. The amount of these irregularities vary considerably from place to place, but there is no place where they are uniform.

Q. I will ask you to look at this map which has been marked Exhibit 35. Is that a structural map that was prepared by you, Mr. Hudnall?

A. Yes, sir, it is.

Q. Would you step over here, please, sir. Does that structural map indicate the contour lines on top of the Woodbine sand as near as you have been able to place those lines from the data which were available to you?

A. Yes, sir, it does, considering the interval that was used in contouring; this contour interval is only twenty feet. I have a larger scale map that reduces it down to ten feet, and that map is a little more accurate than this map, but this map is accurate for a 2,000 foot scale map.

Q. Is the top of the Woodbine section regular or irregular?

A. It is highly irregular.

The Court:

Counsel, is there anything to be gained by cumulating this evidence? If it is disputed, of course, then I will let you put it on, put on your evidence to sustain your position, but when you get on matters that have been testified to before and nobody is controverting them, what is the use of cumulating them?

478 Mr. Hart:

On this particular point, if the Court please, I understood Mr. Buck to say that the formation was regular and that is the reason I offered it.

The Court:

You may be right and I may be wrong.

Mr. Hart:

I understood him to say it was sufficiently uniform--

The Court:

I understood him to testify one place it was higher and one place lower.

Mr. Hart:

All right, sir, I will pass on from that.

The Court:

That, in the last analysis, is about all you are trying to do, isn't it?

Mr. Hart:

The irregularities in the sand?

The Court:

Yes.

Mr. Hart:

Yes, sir.

The Court:

Don't cumulate this evidence.

Q. Mr. Hudnall, have you prepared a map which shows the conditions in the East Texas Field with reference to the location of the marginal wells and abandoned wells, the pumping wells, wells making water, and other information in connection with the field?

A. I have.

Q. Is that this map?

A. Yes, sir.

Q. Now, Mr. Hudnall, that map will be identified as Exhibit 40. Mr. Hudnall, will you explain to the Court, please, what the various points on that map show, what they are intended to show?

A. The heavy black line represents the border of the field.

479 Mr. Moody:

The water or border?

A. Border, b-o-r-d-e-r, the periphery. The large circles about the size of a quarter on the outside of the black line are dry holes that have been drilled outside of the producing area. The large circles of similar size, but colored in orange, are dry holes that have been drilled on the inside of the field. These dry holes represent areas in which either the sand completely pinched out, or areas in which the drainage area of the well at that locality was so restricted that they would not produce in commercial rate due to the tightness of the sand, low porosity and low permeability.

Q. Mr. Hudnall, before you leave that, do you or not find within a ten acre area around those dry holes which were drilled within the field producing wells?

A. Yes, sir, there are in numerous cases offsetting wells that are flowing to these dry holes that were drilled that were within less than ten acres drainage area of the dry hole.

Q. Is that shown on the map that you have prepared there?

A. Yes, sir, all of the producing wells in the field are shown, all shown on the map by small dots, and the position of those wells is correctly shown. Also the position of the dry holes are correctly shown, and it will be observed by close observation of the location of these wells that there are numerous of them within less than 660 feet of those dry holes.

Q. As you have drawn the map, the map which was—the wells which are in the center of those circles are the dry holes and other wells within that circle are producing wells?

A. That is correct.

Q. And do you find numerous instances on 480 there where you find producing wells within a circle close to dry holes and within the area of the field?

A. Yes, sir, numerous areas.

Q. What does that indicate, if anything, with reference to the irregularities of the sand within the field itself?

A. It shows that the permeability of the sand is so low or the sand is so low that the dry holes would not produce at commercial rates. That is, the drainage area of those dry holes was so restricted it would not reach out to producing sands within 300 or 400 yards of those holes.

Q. Well, would they drain?

A. No, sir; they would drain some oil, but not in commercial rates, so the wells were abandoned due to that.

Q. Could the oil be recovered, then, by drilling just one well to ten acres?

A. No, sir.

Q. Now, what other marks do you have on there aside from the dry holes?

A. The smaller red circles are wells that were once commercial oil wells that have been abandoned since then. That is, they have produced their recoverable and have reached the end of their life and have been abandoned. The size of that red circle as exhibited on the map is such that the radius of the circle is the diagonal of a ten acre drainage pattern. That is, it represents the distance from the well that would be located in the center of a ten acre area to the diagonal corner of a ten acre tract and would be the area which a well would have to  
481 drain if it did drain all of the recoverable oil from a ten acre area.

Q. Now, in all of that surface adjacent to wells that have been plugged or abandoned do you find wells still producing?

A. Yes, sir, I find numerous cases where as many as three to seven producing wells, within this ten acre drainage area of the wells that have already ceased to produce.

Q. What would those facts indicate about the nature of the Woodbine sand in the vicinity of those wells?

A. They show without question that those oil wells did not drain all of the recoverable oil within a ten acre area of the well.

Q. Would it indicate anything as to the characteristics of the Woodbine section in that vicinity?

A. Yes, sir, it would indicate definitely that those characteristics are highly variable.

Q. Where do you find the plugged and abandoned wells with reference to the center or outside of the field?

A. They are usually on the periphery of the field, though in a few cases there are some that are as much as two miles inside.

Q. Do you find the abandoned wells on the east side of the field as well as on the west side?

A. Yes, sir, there is a large area of abandoned wells on the south end of the field, in the southeast of London, in Joinerville, the Joinerville area. These wells are located in areas where the sand had a very low permeability and a very low pressure condition exists. The drainage area of some of these wells was restricted to less than two acres.

Q. Well, now, how—what do you mean by that and how do you show that?

482 A. There are some wells still producing that are within 300 feet of the wells that are plugged and abandoned, and it is obvious that if the wells that are plugged and abandoned had not recovered all the oil that was within a two acre drainage area of the well they would still be producing.

Q. Is that or not on the highest part of the structure?

A. Yes, sir, that is the highest part of the structure.

Q. Do you find plugged and abandoned wells all along the eastern edge or lower edge of the structure?

A. Yes, sir, there are numerous plugged or abandoned wells along the eastern side. Some of them as much as two miles inside the eastern limit.

Q. Are some wells east of those abandoned wells producing?

A. Yes, sir, some of those east of abandoned, these abandoned wells, are still producing.

Q. What does the fact that those abandoned wells along the eastern edge of the field indicate with reference to whether or not the east edge of the field will go out of production before the center of the field?

A. They clearly show that the eastern side of the field is being abandoned before the middle of the field is, and they indicate very clearly that abandonment will advance from east to west, toward the middle of the field.

Q. Now, what with reference to the plugged and abandoned wells on the west side of the field can you say with

reference to the tendency that it shows, whether or not the abandonments will begin at the west and go towards the center of the field?

483 A. Well, most of the abandonments on the west side are on the extreme west side with the exception of local areas, like in the Gladewater townsite, which is reasonably close to the west side, and as you go eastward the number of abandonments decreases, so that undoubtedly the last area to be abandoned, moving eastward, will be somewhere near the middle or maybe slightly west or slight east of the middle.

Q. Do you find areas west of the Gladewater area which are still producing oil?

A. Yes, sir, there are numerous wells within a quarter of a mile of the Gladewater townsite that are still flowing and still producing at commercial rates, while inside of the townsite there are some forty wells that have been plugged and abandoned. The large map, the inset in the northwest corner of the exhibit, shows in detail the Gladewater townsite area. The red circles shown here likewise are constructed so that the area inside of the red circle is the drainage area of the well.

Q. Would the fact that wells still farther west from abandoned and plugged wells are producing oil, would that indicate anything as to whether there are lenses or other conditions in the structure which would indicate that the oil would be lost if those wells to the west had not been drilled and had not produced the oil?

A. Yes, definitely separated from the Gladewater area, separated by shale or volcanic ash, the part that lies west of it, that oil would have been lost, and the water did not migrate horizontally, it was very largely vertical in movement of the water, and that caused the  
484 final abandonment of those wells.

Q. You are speaking of the particular condition that existed in the vicinity of Gladewater?

A. Yes, sir.

Q. And that Gladewater area is west of the Rowan & Nichols property?

A. Yes, sir, almost due west.

Q. What else is shown on your map besides dry holes and abandoned wells?

A. The small lavender or purple dots are sub-marginal wells. The size of the dot is likewise the size of the drainage area of the well, if it drained a complete ten acre area.

Q. By sub-marginal wells you mean what?

A. They are wells that will not make twenty barrels per day, producing at their capacity, at the present time.

Q. Do you find the sub-marginal wells on the east side as well as on the west side?

A. Yes, sir, there are probably more—there are undoubtedly more sub-marginal wells along the east side of the field from Kilgore south than from any other part of the field.

Q. Is that the highest part of the structure?

A. Yes, it is.

Q. Do you find sub-marginal wells on the east side of the field as you go farther north?

A. There are not so many sub-marginal wells. There are a few sub-marginal wells scattered entirely along the east side, but the area immediately east of the Rowan & Nichols lease has fewer dry holes—I mean fewer abandoned wells and fewer sub-marginal wells than does most of the area along the east side.

Q. Within the ten acre (radius or ten acre  
485 area around the sub-marginal wells do you find wells which are not sub-marginal which are flowing or pumping more oil than a sub-marginal well would make?

A. Yes, sir, there are some wells offsetting the sub-marginal wells which are flowing. The flowing wells would undoubtedly produce 300 or 400 barrels or more while the sub-marginal wells won't produce more than from five to eighteen or nineteen.

Q. Does that indicate anything with reference to whether or not one well on ten acres would drain all of the oil within that particular vicinity?

A. It shows without question that they will not, a well that only produces from five to eighteen barrels a day producing at capacity cannot be draining very far from the well bore.

Q. Does it show anything with reference to the regularity or irregularity of the Woodbine section in that area?

A. It shows definitely that the Woodbine section is very irregular.

Q. Now, what other things are shown by that map, Mr. Hudnall?

A. The light yellow color represents the areas in which all of the wells are pumping wells and not making water.

Q. Generally with reference to which edge of the field you find the pumping wells, do you find the pumping wells which are not making water?

A. By far the majority of them are on the south end of the field, on the east side.

Q. Is that or not the highest part of the structure?

A. Yes, sir, it is, and it is in that portion of the field where there is tight sand and a shaly sand and consequently a low pressure area.

Q. Does that or not indicate to you that the east side of the field will go out of production before the center of the field?

A. Yes, sir, without any question. Generally speaking the abandonment will follow by increasing the area around the wells that have already been abandoned and the area around the wells that are sub-marginal and then out to the area that is now inside of the yellow line on the east side.

Q. Do you find pumping areas where water is not being made by the wells at any point on the west side of the field?

A. Yes, sir, there are numerous places along the west side of the field where although the pressure is 1,180 to 1,200 pounds per square inch and the wells do not make water, still they are pumping wells.

Q. Explain how that can occur.

A. That is brought about by the presence of volcanic ash and shaly partings in the sand grains themselves. The Woodbine formation was laid down at a time when there was considerable volcanic eruption taking place on the face of the earth. This volcanic ash settled in the Woodbine section and the ash settled between the sand grains and greatly retarded the permeability of that formation.

Q. Then would you indicate, please, sir, what the green area on your map shows?

A. The green area is the area where the wells are making water. There are a number of pumping wells inside of the green area, but they obviously  
437 could not be colored both yellow and green, so they are not shown individually, but I would say fifty per cent of all of the wells that are inside of the green area are likewise pumping wells as well as wells making water.

Q. Do you find wells which are producing without water west of the—west of other wells which are making a considerable amount of water?

A. Yes, sir, there are numerous places along the field where the extreme westernmost wells are clear of water production while to the east there are a number of wells that are making water and some dry holes. In other cases wells that have been plugged and abandoned—

Q. Does that indicate with reference to whether the encroachment of the water has been regular or irregular?

A. It shows definitely that the encroachment has been very irregular.

Q. Does that indicate anything with reference to the nature of the structure?

A. Yes, sir, it shows definitely that the structure is partitioned off by the shale partings and impervious material and material of low permeability.

Q. Now, because of the conditions that you have delineated there on your map, shown graphically, Mr. Hudnall, would you or not say that by permitting a drilling to a density of one well to less than ten acres the Railroad Commission has prevented waste and has caused a greater ultimate recovery of oil from the East Texas Field?

488 Mr. Moody:

May it please the Court, I object to that. It is a collateral attack upon the Railroad Commission's findings. It is an attempt to show that the more oil, the more wells you drill the more oil you will get, and it is immaterial and irrelevant whether the Railroad Commission has done wisely or unwisely, acted wisely or unwisely in allowing wells to be drilled on short locations.

Mr. Pollard:

If the Court please, we will be able to show that there have been specific findings by the Commission in its rules after the State-wide hearings at which evidence was admitted by the various persons that appeared before them to show that there would be more oil recovered from more wells that were drilled. It is in conformity with the spacing rule rather than opposed to it.

Mr. Moody:

All right, suppose that is true, I don't see what that has to do with whether the Commission acted wisely or unwisely.

The Court:

This is an expert. It is not necessarily binding upon the Court for the expert to testify as to his opinion, no harm can come out of it.

Mr. Moody:

No, sir, but that is a subject on which you can get these engineers to talk for hours. I know Your Honor isn't going to permit them to do it, but it just presents a proposition in the case that doesn't bear on the issues involved.

The Court:

I don't want to put any false issue in here that would require you to put a lot of testimony in to offset it, but I don't see any harm in letting him express his opinion.

489 Mr. Moody:

Note the exception.

The Court:

Go ahead, overrule the objection.

Mr. Moody:

Note the exception.

A. In my opinion the drilling of additional wells to a density of less than ten acres to the well will increase the ultimate recovery of the field by several hundred million barrels.

Q. Does a system of allocation which would encourage the drilling of wells—in other words, a system of allocation which is based on the wells or by potential per well, as the present method, does that or not tend to prevent waste and increase the ultimate recovery of oil from the East Texas Field?

Mr. Moody:

Pardon me, May I ask the Reporter to read that question? (Question read.) I object to that as being immaterial and irrelevant.

The Court:

I overrule the objection.

Mr. Moody:

Note the exception.

Q. Answer the question, please.

A. I think that it definitely tends to increase recovery of oil from the field and thereby decrease waste.

Q. Now, Mr. Hudnall, we will pass to the question of a marginal allowance or a minimum below which wells cannot be restricted provided they can make that minimum amount. In your opinion, is there any necessity for the prevention of waste for fixing a minimum below which wells cannot be restricted, provided they can make the amount of the minimum?

A. Yes, sir, very definitely.

Q. Now, would you explain that to the Court, please, why there is a necessity for a marginal allowance to wells?

A. There are numerous wells that have been  
490 drilled around the margin of the field that would never have been drilled if they had not had as much as twenty barrels minimum allowable, because you cannot go around on the edge of the field and explore for oil and drill the dry holes that have been drilled around the edge of that field to define it and depend upon less than twenty barrels per day to get your returns back.

Q. Would the oil that they have produced be produced by other wells if those wells had not been drilled?

A. Some part of it would have been produced by other wells, but a very large percentage of it would never have been produced.

Q. Does the drilling of those wells increase the ultimate recovery from the East Texas Field and prevent waste?

A. Yes, sir, they have caused the development around the field to extend, that is, around the extreme margin of the field where there is only five to ten feet of sand, they have caused that area to increase by an amount of acreage from about 125 acres back in 1934 and 1935, up to about 138,000 acres at the present time.

Q. You have pointed to the western edge of the field. Does that same line of reasoning apply to the eastern edge of the field?

A. Yes, sir, there have been numerous wells drilled extending the eastern edge of the field for the same reason. Back in 1934 and 1935 the eastern limit line as depicted by the geologists of that time was essentially a straight line. By the drilling of these wells on the edge of the field small outsets and insets in the field have brought about this irregular outline of the eastern limit of the field at the present time.

Q. Has the drilling of those wells, which  
491 would not have been drilled except for this marginal allowance, caused more oil to be recovered in the East Texas Field than would otherwise have been recovered?

A. Yes, sir I think so, unquestionably.

Q. Now, you have spoken of the influence of the marginal allowance on the ultimate extension of the field and additional recovery. Now, with respect to marginal wells or wells which are becoming marginal wells, would you state whether or not a minimum allowance for those wells is necessary to prevent waste?

A. Yes, sir, if the wells are restricted very much below ten barrels per well a day there would be numerous abandonments due to the expense of operating the wells. On the west side of the field where the wells are making, some of them, from seventy to ninety-five

per cent water, when the daily production declines to below ten barrels they are plugged and abandoned.

Q. Now, what is the condition on the east side of the field and how does the marginal allowance affect the wells on the east side of the field?

A. There is likewise plugging and abandonment of wells on the east side of the field due to paraffin troubles; as the daily production from the well becomes less and less the paraffin trouble increases. That is, the oil coagulates in the tubing and prevents the well from pumping and requires considerable expense to clean this paraffin from the tubing. Sometimes it has to be done once a month and sometimes once every two weeks and some wells if they are producing a little more

492 than twenty barrels, that are yet pumping, will continue for three months without cleaning of the paraffin, but the paraffin problem is a very big problem on the east edge of the field. On the south side numerous wells are being plugged over there when they get down to five or ten barrels a day, but ordinarily five barrels would be the approximate economic limit.

The Court:

What is the price of oil?

A. \$1.10 a barrel at the present time.

Q. Of course, a raise in the price would cause you to vary your estimate as to what the marginal allowance would be and the wells still operate?

A. Yes, sir. If the price of oil should go down to ten cents a barrel there would be dozens of wells that would be abandoned immediately, but if the price stays up they will continue to produce.

Q. What would be the result of premature abandonment of wells throughout the field upon causing waste?

A. A very large per cent of the oil that they would produce had they not been plugged and abandoned will be lost and irretrievably recovered.

Q. You mean it will not be recovered?

A. That is right.

Q. Now, do you know approximately how many wells have been drilled since the present proration order was adopted by the Commission in April of 1933?

A. There have been about 17,000 wells drilled.

Q. Do you know how many of those wells would have to be prematurely abandoned if their marginal allowance was stricken down?

A. Well, there would be literally hundreds  
493 If you place no margin or put no top allowable on the field and let the field run unrestricted.

Q. Suppose you kept the top allowable but knocked out the marginal allowance, would there or not be numerous wells stricken out and oil irretrievably lost which otherwise the oil would be recovered under the present plan?

A. Of course, you have to have a limit on that lower limit. If you restrict them for any reason below five or ten barrels a day, regardless of what the reason is, there are going to be numerous wells abandoned.

Q. Is the present marginal allowance of twenty barrels a day, which when considered with the Saturday and Sunday shutdown amounts to an average of about fourteen barrels a day, is that in your opinion a reasonable marginal allowance for wells in the East Texas Field?

Mr. Moody:

If the Court please, that is immaterial and irrelevant.

The Court:

I think you are asking him to pass on the ultimate question that the Court will have to pass on, in the form you put it.

Mr. Hart:

I will change the form of it.

The Court:

● looks like you are asking a witness if somebody is guilty of negligence.

Mr. Hart:

I will change that.

Q. With reference to the prevention of waste, is a marginal allowance which averages approximately fourteen barrels per day, does that have a reasonable relation to the prevention of waste, in your opinion?

A. I think it does.

494 Q. Just explain that, please, sir.

A. Fourteen barrels a day is about the minimum at which they will drill and produce oil. You can produce it on a lease for less than that, but you can't go out and drill a well on very much less than that.

Q. Mr. Hudnall, have you made a tabulation of the number of abandoned wells in the East Texas Field within the last three or four years?

A. Ye., sir, I have a sheet tabulating the periods at which these wells were abandoned.

Q. Do you have more than one copy of that?

A. Yes, sir, I have two copies.

Q. Mr. Hudnall, what does that show with reference to the abandonment of wells within the last four years in the East Texas Field?

A. It shows that during the year 1932 there was one abandoned producing well; in 1933 there were four; in 1934 there were seven; in 1935 there were five. Beginning at this point the abandonments increased very materially. In 1936 there were twenty-four; in 1937 there were seventy-six; in 1938 there were 207, and during the month of January, 1939, there were about thirty, twenty-five to thirty.

Q. Now, in the history of the field, the natural history of the field, were those abandonments to be ex-

pected, according to geological data and experience in similar oil fields?

495 A. Yes, sir, they represent the weakling wells, that is, the weakest wells, and they are the natural occurrence in the history of any oil field.

Q. Have you compared the rate of abandonments with the rate of drilling of new wells in the East Texas Field so that you could state whether or not the rate of abandonment will in the future probably exceed the rate of drilling of new wells?

A. Yes, sir, I have made some calculations on that feature.

Q. Would you state in general what your conclusions along that line are?

A. The rate of development in the field has declined very materially during the past two years. The decline in this development rate is by years approximately as follows: In the year 1931 there were approximately 3,620 wells drilled and completed producing; 1932, 5,732; 1933, 2,476, the big decline in this year being due to the low price of oil; 1934, 3,686; 1936, 4,038. From this period it begins to decline to the end, up to the present time. In 1937, 2,458. I believe that those figures, I made, a year behind in those. The year 1934, 3,686; the year 1935, 4,038; the year 1936, 2,458; 1937, 2,351; 1938, 1,771, and during January, 1939, approximately 91 or 92 wells, that is, at the present time that are being completed at a rate of about half what they were a year ago. Projecting this rate of decline in development into the future indicates that during the year 1939 there will be about 1,000 wells drilled, and the year 1940 some 500 to 700, and 1941 a few hundred, and that, according to this decline, would be the approximate total number of wells in the field. However, that will of course be affected by the price of oil and numerous other things.

Q. Well, now, if that trend is carried out will  
 496 the number of abandonments exceed the number of new wells completed and therefore there will be fewer wells among which to divide the allowable production in the East Texas Field?

A. Yes, sir, undoubtedly the rate of abandonment will catch up with the rate of completions in a couple of years at that rate.

Q. Which part—

A. And thereafter the rate of abandonments will materially increase over and above new completions.

Q. Which part of the field will go out of production last, Mr. Hudnall? Will the area around the Rowan & Nichols lease go out soon, or will it be among the last areas in the field to go out of production?

A. In my judgment, it will be among the last areas. I think if you took an area or radius of one mile from this lease, that somewhere within that mile you would have the approximate last part of the field to produce.

Q. If you now gave them an allocation which ignored the fact that they would produce longer than other areas in the field, would their ultimate recovery be greater or not than their recoverable reserve?

A. Well, if you gave them an allocation that was in proportion to the oil that is in that area as compared with the total oil in the field they undoubtedly would under that method ultimately produce more oil than originally was under their tract that was recoverable, because they would be producing—say they owned, to illustrate it,

one per cent of the reserve. Now, if they get  
 497 one per cent of the allowable but get that for twice as long a period they obviously would get out with twice as much oil.

Q. Now, Mr. Hudnall, you have spoken of the irregular characteristics of the field and the way in which it varies, and I will try not to duplicate the testimony along that line, but I would like to ask you this: There

has been some testimony about Schlumbergers and other information which has been recently acquired. Does that information which has been acquired by Schlumbergers and others make it easy to calculate mathematically the reserves under a tract of land, or does it make it more systematic?

A. I think it emphasizes the reserves under a tract, but it gives you information on which you could make some estimation.

Q. Tell us what the Schlumberger shows and the limitations of the Schlumberger.

A. In the East Texas Field there are some leases where the acreage of the lease, say, is sixty-five acres. I have in mind one lease where there is sixty-five acres. It is located out pretty well in the fairway. I have Schlumberger records on nine wells on this sixty-five acre lease. There are no two of these wells that have the same percentage of Woodbine that is saturated with oil sand. The variation on this sixty-five acre lease amounts to seventy to eighty per cent. The wells with the lowest percentage of the formation, that is, saturated oil sand, will run around forty-five per cent of the total thickness, and the well that has the highest will run around eighty per cent, so one of them is at least fifty to seventy per cent higher. Although the sand thickness

498 is the same, the oil content in the sand, due to this variation in the percentage of the sand, will vary fifty to seventy per cent. Then in addition to that the porosity would undoubtedly vary fully that much, and the Schlumberger records show without any question that the irregularities exist locally, they are not general conditions that can be interpreted from one well to the next because they vary in each well.

Q. Aside from the cost of making Schlumberger tests on the 25,000 or more wells in the East Texas Field, what difficulty do you have practically in making Schlumberger tests on completed wells?

A. In order to make a Schlumberger test the well must have the casing removed in the zone that is being tested, or the liner. In the case of most of the wells in the East Texas Field there is a liner extending from the bottom of the casing down to the bottom of the hole.

Q. What do you mean by a liner, Mr. Hudnall?

A. That is a perforated piece of casing that goes down below the cemented casing and it is simply dropped in the well, sometimes it is cemented, but usually not. The purpose of it is to keep back the shale and volcanic ash and the sluffy material from covering up the oil sand, and where there are liners in the wells you cannot make a Schlumberger test. The liners could be pulled out on most of the wells, probably two-thirds of them, or three-fourths of them, but the expense of pulling the liner and making the Schlumberger test would be very great.

Q. What about cases of the wells where the casing goes all the way down and they have shot the casing, could you take a Schlumberger on those wells?

A. In most of the wells where the casing is run down into the sand and the casing is perforated Schlumbergers were run before the casing was extended into the sand.

Q. Of course, a Schlumberger would show the sand only as far as the well had been drilled into the sand, is that correct?

A. Yes, sir, it would only give you the sand section to the extent of the penetration of the well into the sand.

Q. Now, Mr. Hudnall, I will ask you to state whether in your opinion the potential tests indicate or reflect to any degree the factors which go into the productive capacity of a well, and state what factors, if any, that potential test, that potential would show, and what factors it would not show, if there are any?

A. The potential of an oil well in the East Texas Field in my opinion reflects porosity, permeability, sand

thickness, that is, saturated sand thickness, structural position to some extent, connate water, and to some extent the percentage of the pore space that carries oil.

Q. Are those all of the factors that go into a consideration of the productive capacity of a well?

A. All of those factors definitely enter into determining what a well will produce.

Q. Do you have a more accurate picture of the way those factors actually work in combination by making a potential test than by sitting down and trying to figure out mathematically what the recoverable reserves under a tract or within the drainage area of a well would be?

A. I think the testing of the well and seeing what it will actually produce is one of the best indices of its future production that there is. It has been my experience in appraising millions of dollars worth of property in the East Texas Field that the best method is to test the wells as well as get the other data, and it has been my experience to test more than 2,000 wells in the field for this purpose.

Q. Mr. Hudnall, does the potential indicate the amount of recoverable reserves within the drainage area of the well?

A. I think it indicates it.

Q. Of course, it does not indicate the surface acreage of the lease upon which the well is located, does it?

A. No, sir, the drainage area of an oil well doesn't pay much attention to surface acreage. There is very little relationship between surface acreage and drainage area.

Q. If a man feels his property is being confiscated by drainage is there a rule of the Commission, aside from the proration order, which permits him to drill wells on his tract in order to protect himself?

Mr. Moody:

The rules themselves would be the best evidence.

The Court:

I think so. As I understand it, the case we have here is that the parties have been allowed five wells.

Mr. Hart:

Six wells, if the Court please.

The Court:

There is a wrangle as to that.

Mr. Hart:

The order shows the sixth well has been granted and no rehearing requested.

501 The Court:

How many more did they ask for?

Mr. Hart:

They asked for twenty wells, which would make twenty-five wells on the tract.

The Court:

You asked him if there is a rule that would enable them to get more wells. Of course, the rule would be the best evidence. And in the second place, what is the pertinency? How does it affect the situation?

Mr. Hart:

Our purpose is to show a man can protect himself.

The Court:

If a man is in jail it may be you can't keep him there, but you do. You say they can drill more wells, but the Commission refused him.

Mr. Hart:

We have shown, if the Court please, that they have been drilled to a greater density than the average of their surrounding area. Not greater than the Wood tract, but much greater density than the average of surrounding areas and the field as a whole.

The Court:

I sustain the objection. The rule would be the best evidence.

Mr. Tilley:

Your Honor, I want to correct something Mr. Hart said. I think Mr. Hart misstated the facts innocently. The permit was granted in a case where other permits were applied for alternatively, however, to our application for an adjustment in allowable under one case number. Then when that one permit was granted and the others and the adjustment of allowable denied, we filed for rehearing and they reopened the case.

502 Mr. Hart:

I think the best way to determine that would be to read the order. The order itself grants six and then grants a rehearing on wells seven to twenty-five, and as far as the granting of well No. 6, there has never been a rehearing granted on that, and so far as I know, no application for rehearing. The order is in evidence here.

The Court:

All right.

(Mr. Hart, counsel for defendant, then read the order in question, Exhibit 15.)

Mr. Hart:

Pass the witness:

(At this time a short recess was had, at the conclusion of which the following proceedings were had, to-wit:)

Cross Examination.

Questions by Mr. Moody:

Q. Mr. Hudnall, most of your testimony, I believe, has been related to that last map that was put up there, Exhibit 40?

A. Yes, sir, very largely.

Q. Now, that outside line, that black line that goes around that map, is intended to show the outside limit of the productive area in the East Texas Field, as I understand it?

A. That is correct, as they are indicated at the present time.

Q. Now, all of those wells that you have shown on that map as having been abandoned or as having come into water, as much of the map as I can see from here—let's see if I am not right. The red ones are abandoned wells and the purple are sub-marginal wells and the large orange circles represent dry holes?

A. That is correct.

Q. All right. Now, you haven't got any dry  
503 holes down through the center of the field, have you?

A. There is one about two miles in on the lower part of the field. It is not in the center, but within a half a mile of the center, just west of the town of London.

Q. Well, how far is that from the south end? I don't know where the town of London is.

A. Right here.

Q. That is in a water area, isn't it?

A. At the present time, yes.

Q. All right. Now, then, that is some twenty-five or thirty miles from the tract of land involved in this lawsuit, isn't it?

A. Yes, sir.

Q. All right. Now, then, Mr. Hudnall, how many acres or approximately how many acres are there inside your black line that borders the productive area of the field.

A. About 138,000 acres.

Q. About 138,000 acres?

A. Yes, sir.

Q. You haven't got your contour lines on here?

A. I have the contour line on which this lease is located.

Q. Suppose you take the twenty foot contour line that is not shown on that map, but it is shown on this one over here, isn't it?

A. Yes, sir.

Q. Suppose you run that twenty foot contour line around in there inside your black line, how many acres would you have inside your twenty foot contour line, approximately?

A. I would estimate it at around 10,000 to 15,000 acres.

Q. I am not talking about between the outside here.

A. Well, it is inside of the black line and outside of the twenty foot contour.

Q. I am talking about inside of the twenty foot contour line.

A. All of it except 15,000 or 20,000 acres. That would be rough.

Q. What?

A. That would be roughly 120,000 acres.

Q. 120,000 acres would be within that area enclosed in the twenty foot contour line, is that right?

A. That is approximately correct.

Q. That would mean about 123,000 acres of land inside of the twenty foot contour line?

A. Yes, sir.

Q. All right. Now, then, all the testimony that you have given here, or the major portion of it that you have given here, with respect to this map and what it shows with reference to dry holes and abandoned holes and sub-marginal wells, most of it has to do with that 15,000 acres that is between the outside limits of the field and the twenty foot contour line, isn't that right?

A. Well, probably you could say the most of it does. Of course, there is about a third of the wells that have been plugged and abandoned are on the east side of the field and about two-thirds of them on the west side.

Q. But over there where it has been abandoned, on the east side where they have been abandoned, with a few rare exceptions, you have less than twenty feet of sand there, haven't you?

A. Yes, with few exceptions.

Q. All right, and over on the west side, with  
505 a few rare exceptions, the wells that have gone to water and have been abandoned, you have less than twenty feet of sand thickness?

A. Well, in the Gladewater townsite you have forty wells—

Q. We will call that an exception. Let's leave that out for the time being. That is true, isn't it?

A. Well, with that exception and probably one or two other small areas.

Q. All right. Now, in the Gladewater townsite area, that territory is drilled to a great density, is it not?

A. In Gladewater?

Q. In the townsite?

A. About a well to two acres.

Q. About a well to two acres?

A. A little less than two acres to the well.

Q. And that is taking in the whole townsite?

A. That is correct, taking in about 500 acres.

Q. Now, then, you can draw that down and find for me in the Gladewater townsite instances in which the drilling density is as great as ten wells to an acre, can't you?

A. No, I don't believe you can find that in Gladewater.

Q. All right, five wells to the acre?

A. Pretty close to that.

Q. Pretty close to that. It is a densely drilled place now. Another thing, there was a time back there in the East Texas Field when they were producing a lot of hot oil, wasn't there?

A. Yes, sir.

Q. And the Gladewater townsite was one of the places where they were doing that?

A. Yes, sir, it was very notorious in that.

Q. All right. And the withdrawals from the Gladewater townsite were among the greatest in the entire field, isn't that true?

Mr. Hart:

We wish to object to any violations of the orders of the Railroad Commission. I don't see how that could be considered relevant and material to this case.

Mr. Moody:

That is not what I am getting at. I am trying to show that the abandoned wells in the Gladewater area is largely due to the intrusion of water brought about by the tremendous withdrawals of oil in that area, and that is the exception he said, and to show that particular exception that exists within the twenty foot contour line is explainable by that fact.

The Court:

Overrule the objection.

Q. Well, you have heard my statement to the Court. I have stated the facts about right, haven't I, what I am trying to prove? That is the truth, isn't it?

A. I think that is about the facts about it.

Q. So, the abandonment of these wells in the Glade-water townsite has been contributed to substantially, if it is not directly attributable to, the large withdrawals of oil there?

A. Yes, sir.

Q. All right, now, that is the one exception of any importance to abandonments within the enclosure of the twenty foot contour line?

A. Yes, sir, most of the others are outside.

Q. All right. Now, then, Mr. Hudnall, so if  
507 you get inside of the twenty foot contour line, that is, inside of the area where they have more than twenty feet of sand, why, the abandonment and the dry holes are not one in ten thousand, are they?

A. Well, I would have to make that calculation.

Q. Well, it is negligible?

A. They are relatively small.

Q. It is negligible, isn't it?

A. I don't think it is negligible for the purpose for which the data is submitted.

Q. By and large, taking the wells in that area, the number that have been abandoned and the number that are dry, it is a very small ratio, isn't it?

A. That is true.

Q. Now, over on the east side there where you have got some small wells that are shown to have been drilled in dry and some to be marginal wells and some to be—sub-marginal, I mean—that is right over where the sand pinches out, or is against the Sabine Uplift. I believe you call it, isn't it?

A. Yes, sir, it is over in that area. Of course, there are a number of flowing wells in between those and the eastern side.

Q. Mr. Hudnall, that pinching out over there is not a long and even line, is it?

A. No, it is rather irregular.

Q. In other words, that pinching out comes along like, I don't mean exactly like, but it waves in and out as your black line along the eastern edge of your map waves?

A. That is correct.

Q. Now, while you put your line, the black  
508 line here, we will say about halfway between Kilgore and Joinerville down here, now, you have your black line bending out here, in places you carry it out there by reason of the fact that you have a well over here somewhere that produces?

A. That is correct.

Q. Now, of course, you don't mean that the pinching out—you said it isn't long and even, but it is even more irregular than you can show it on that map, isn't it?

A. That is true.

Q. Because it will finger out here for 200 yards and maybe very narrow, some fellow may have luck enough to hit in that 200 yards, and down here it will finger out for 500 yards, some fellow may have been lucky enough to hit there, but whereas back from him to the right or left of that it may have already pinched out, so that a well drilled in there would be dry?

A. That is correct.

Q. And so when you show with these red dots—wait a minute—the green circles, when you show those green circles, the dry holes, it may be that one fellow over here in offset distance happened to drill into one of those fingers where the sand fingered out and another fellow got over here where there wasn't any fingering?

A. That is right.

Q. Now with reference to the abandonments in some places where you get right out to the edge with the sand fingering out, it is thin when it gets out there, is that right?

A. Yes, sir.

Q. And it is intermingled with more substance  
509 than the Woodbine sand and is not so good as  
back over here in the better part of the Wood-  
bine sand and the permeability is naturally better?

A. Yes, sir.

Q. So, where you have had these abandonments and  
dry holes, that is not typical of the East Texas Field,  
the man out there is hanging on by his eyebrows, isn't  
that true?

A. It is the same condition the rest of it will be in  
in five years or ten years or twenty years. It will all  
come in as the field is abandoned.

Q. Where you have twenty feet of sand, of permeable  
sand, along the east edge of the oil field over there, that  
is not going to be dry in five years from now, is it, or  
ten either, at the present rates of production?

A. No, if he has five feet of good oil sand and perme-  
able that will not be dry in five years, from the east  
side west.

Q. All right. Now, let me ask you this question:  
If you would consult the logs of those wells that have  
been abandoned you would expect to find the most of  
them having very little sand, wouldn't you?

A. Yes, sir, that is true.

Q. And if you could see the core of them you would  
expect to find those cores out there at that edge and  
in that thin sand just in such a condition that it was  
a problem of nature whether this was going to be Wood-  
bine sand or something else, Georgetown lime or some  
other sort of formation between, just weaving in to-  
gether as nature laid them down in some geological age,  
isn't that right?

A. That is true, but it is largely Woodbine.  
510 It isn't a question of whether it is Woodbine or  
something else, it is Woodbine, but very little  
saturation in it.

Q. Now, then, Mr. Hudnall, you testified, as I understood you, that a per well plan of proration you thought was good, or one of its virtues was that it would lead to the drilling of wells and finding of oil?

A. Yes, sir, I think that is the best virtue, or one of the best, that it has, from the viewpoint of physical waste.

Q. Isn't this the reason it has that virtue, that it encourages a man to drill a well because he knows if he gets a poor well that he will get just as good an allowable as a man that has a big well?

A. Well, that is partly it. He knows that if he drills a well that he is going to produce enough oil from it under the present regulations, in a good area, to make money on it.

Q. In other words, if a man has a tract of land out there and he knows he hasn't got but ten feet of sand in it, or twenty feet of sand, and that he will not have a very good well, but figuring on twenty barrels of oil a day at \$1.10 a day, that will pay out in just about two years' time, or very little over that, and he is on a per well basis, and another man has a well that will produce 1,000 barrels of oil a day and his will maybe produce only forty or fifty barrels a day, he knows that in drilling on that land he will get just as good an allowable as the fellow that has a very much better well?

A. Yes, that is approximately right.

The Court:

This witness never has testified that this order was on a per well basis. I think Mr. Cottingham said that.

511 Mr. Moody:

All right, I will get to that. Just one or two questions along this line and then I will get to that.

Q. Now, then, Mr. Hudnall, if the field is on a per well basis and a man has half an acre of land and the Railroad Commission will let him drill on it on a per well basis, that man is encouraged to drill, is he not, because he knows that he has fifteen or twenty feet of sand and that he will get on his half acre, his well on his half acre, just as much oil as the man who has ten acres of land or five acres of land and only one oil well on it, and a very much more productive sand under his five acres?

A. Yes.

Q. And that is what you mean when you say it encourages drilling, the per well basis?

A. Well, yes, that is part of it, that is a very large part of it.

Q. Now, Mr. Hudnall, we will take this order that is under attack in this lawsuit. You are familiar with it, are you not?

A. Yes, sir.

Q. In its practical application, whatever it may say, as it is applied and enforced on the East Texas Field, I will ask you if this isn't the result, that each well in the field that will make twenty barrels is allowed twenty barrels?

A. Yes, sir.

Q. All right, then that number of wells which cannot make twenty barrels per day are allowed to make as much as they can, and the amount by which in the total they lack of making twenty barrels is then  
512 divided up amongst those wells having a potential of over 860 barrels per hour and therefore can make more than twenty barrels? Is that question clear?

A. Yes, sir, that is clear.

Q. All right, that is the practical workings of this order in the East Texas Field?

A. Yes, sir.

Q. All right. Now, then, as the result of the way this order is applied in the East Texas Field, there then remains only approximately 7,000 barrels of oil to prorate amongst wells on a potential factor, isn't that right?

A. That is correct.

Q. So, of the 522,591—is that figure correct? Let me have that figure. So, of the 522,591 barrels of oil allowed daily for this field under the Railroad Commission orders, only 7,000 barrels of that, or approximately 7,000, is allocated amongst wells on a potential basis?

A. That is correct.

Q. That is the practical workings of it?

A. That is correct.

Q. That is less than 1.6 per cent of the daily field allowable, isn't it?

A. That is my information.

Q. Well, do you have your slide rule there?

A. I say I think that is correct.

Q. Right, so 98.4 of the daily allowable is allocated on a well basis and less than two per cent of it, or about 1.6 per cent, on a potential basis?

A. Yes, sir.

513 Q. All right. In your opinion isn't that practically a per well basis of prorating the allowable oil of that field?

A. As a practical statement that is true.

Q. As a practical statement it is a per well basis?

A. Yes, sir.

Q. All right, now, Mr. Hudnall, by the way, as a matter of fact, though the schedule here that has been introduced, Plaintiff's Exhibit No. 19, says that the scale of production here is 2.32 per cent of the hourly potential and purports to reflect an allocation amongst wells on a potential basis, in truth and in fact it is not a potential basis, is it?

A. Well, it is practically a per well basis.

Q. All right. Well, now, listen, here is what I am getting at, do you know what the total potential, hourly potential, of the entire field is?

A. Not exactly. I think it runs around 15,000,000 barrels.

Q. Well, my figures are 15,667,543 barrels of potential, hourly potential, is that about right?

A. I think that is substantially correct.

Q. All right, do you know what the hourly potential of the Rowan & Nichols lease is?

A. It is about 960 barrels.

Q. That is per well?

A. Yes.

Q. Well, all of them, the five of them, then, would be about 4,820?

A. Yes.

Q. Now, if you were going to allocate this oil  
514 on a potential basis you would then determine what per cent of 15,667,543 4,820 is and then give Rowan & Nichols that per cent of 522,591?

A. Yes, sir, on a strictly potential basis without any allowance.

Q. That wouldn't even figure out 2.32, will it?

A. I haven't made the calculation on it.

Q. All right, instead of figuring it that way let's state a problem in algebra, wouldn't it be this: The field allowable 522,591 is in proportion, and I will use the unknown factor, field allowable is to field potential as X, the allowable of this lease, is to this lease potential, namely 4,820?

A. Yes.

Q. That would be the correct proportional statement of it, wouldn't it?

A. Yes, if you consider all of the wells.

Q. All right.

A. As a basis for doing it rather than the acreage.

Q. Then, getting back into fractions, you would have 522,591 over 15,667,543 equals X over 4,820?

A. Yes, sir, 4,820.

Q. And that will figure out about 3.33 if you multiply out and determine the value of X?

A. I haven't made the calculation, but the solution of that problem will give you the answer.

Q. Now, I will ask you if this isn't the way the Railroad Commission is doing it, they are dividing—they are determining what per cent of 15,667,543 is of 522,591 and then using that per cent to multiply into the 4,820 and then taking five-sevenths of that, which will give you 232, and then by shutting down two days a week they give you five-sevenths of that, isn't that the way they are figuring it out?

A. I haven't gone through that formula, but I can state to you what I think the formula is and how it is arrived at. I think they allow twenty barrels in every well in the field—

Q. I am talking about how—

The Court:

Let's hear him give his idea. You have a problem here and it is good to hear everybody's views on it.

Mr. Moody:

I didn't understand you.

The Court:

You have a problem and it is good to hear everybody's views.

A. They take the total field top allowable of say 522,000 barrels, and they take the total number of wells and multiply it by twenty barrels apiece, then subtract that amount from the 522,000 barrels, that leaves the amount of oil that will be distributed on a potential basis, and that then is distributed among the wells on a potential basis. Now, that is the practical effect of it after

deducting the sub-marginal wells, which amounts to about 4,000 barrels a day.

Q. Mr. Hudnall, I don't follow—I am sorry, I didn't follow you in that. Would you mind stating that over, please, sir?

A. They start out with a top field allowable of 522,000 barrels per day. They also have a given number of wells, of close to 26,000 wells. They multiply this 26,000 wells by twenty barrels, which if they had exactly that many would be 520,000, but there is a few number less than that; so that the number, that number times  
 516 twenty subtracted from the total of 522,000 for the field top leaves a certain amount that is to be distributed on a potential basis.

Q. I see.

A. That is all there is to it in the practical effect. Now, there is 4,000 barrels of sub-marginal oil that would come off of this first deduction of 26,000 wells times twenty barrels.

The Court:

The potential is in there, it is a big word; but doesn't figure very much in the actual result, does it?

A. No, it doesn't figure but very little as a practical matter. In 1933 they started out and gave the wells fifteen per cent of their hourly potentials. Then as the number of wells increased that percentage decreased, so it was reduced from fifteen per cent to ten per cent, seven per cent to five per cent, and now it is down to 2.32, so that the percentage of the hourly potential factor has been decreased as the number of wells have been increased in order to hold it down to top allowable.

The Court:

Do you mind my taking your witness for a moment?

Mr. Moody:

No, sir, I am glad for you to have him.

The Court:

Have you made any study or given any consideration to this top allowable?

A. Yes, sir, I have given considerable study to it.

The Court:

Do you think that that is as high as it is safe to allow?

A. My own personal—

517 The Court:

From the standpoint of physical waste, or is it a question of the market demand in that allowable?

A. My own personal judgment is it can produce considerably more.

The Court:

Without hurting the field?

A. I think so, but the majority of engineers don't follow me on it, but I personally think it could do considerably more.

The Court:

All right.

Q. Now, Mr. Hudnall, you stated in answer to the Court's question that the potential factor didn't figure very much in it, or the Court asked you if that wasn't the case and you said yes. The potential is not exceeding two per cent, is not exceeding a two per cent factor, is it?

A. No, sir.

Q. In determining the allowable?

A. No, sir, it is not.

Q. In other words, when you said that you multiply 26,000 and some odd by twenty—

A. Yes, sir.

Q. And then you deduct that from the field allowable—

A. Yes, sir.

Q. That leaves you some 3,000 or 4,000 barrels?

A. Yes, sir.

Q. And then you add to that the 4,000 barrels that the sub-marginal wells will not make of the twenty barrels per well allowed to them?

A. Yes, sir.

Q. And that gives you the 7,000 which you say is all the oil that is prorated on a potential factor?

A. Yes, sir.

Q. Do you know where the Commission gets the 2.32 they publish in their proration schedule?

A. Yes, sir, that is the potential factor that they can apply.

Q. Wait just a minute, Mr. Hudnall, I am asking you if you know the formula of mathematics by which they arrive at that figure?

A. Yes.

Q. All right.

A. That is the percentage that can be applied to the number of wells that exist over and above the marginal allowance. That will give you the 7,000 barrels.

Q. Oh, they get that figure by first finding out how much oil there is left after this twenty barrel allowable?

A. Yes.

Q. And then they find out what proportion of the potential—of the allowable the 7,000 barrels is?

A. That is essentially correct. Now, they may arrive at it in some other very complicated way, but that is what it amounts to.

Q. I agree with you that is what it amounts to, the result is the same, but let me ask you if this isn't the way they arrive at it: They divide the total hourly potential of 15,667,543 into the daily allowable of 522,591 and get that figure and then take five-sevenths of that figure and arrive at their 2.32 and say that is the potential factor, and then later on, now, where they get that five-sevenths I don't know, and then later on they give another five-sevenths by allowing you to produce that amount five days out of seven, so in reality  
 519 don't they in fact do this, allow you daily to produce five-sevenths of five-sevenths of that per cent which the field allowable bears to the field potential and call it prorating on a potential basis?

A. Well, I can't tell you exactly how they go through it. I know what the effect is, but to tell you what mental stages they go through to arrive at that, I can't. I think though the five-sevenths is applied entirely after the other calculations are made. I don't think it enters into the original calculations at all.

Q. Well, as I divide 5,200—determine the per cent which 522,591 is of 15,667,543, I find that to be approximately 3.33, and five-sevenths of that I find to be approximately 2.32, and then they allow you to produce five days a week, which in effect amounts to giving you, as I figure it, five-sevenths of five-sevenths of that per cent that the field allowable is of the field potential, and prorate the excess oil on that basis?

A. Well, the sum total essence of it is to give every well twenty barr and whatever is left, what that total amount is between that and 522,000 is distributed among the other wells on the potential basis, considering the 4,000 barrels the sub-marginal wells fail to make.

Q. And for all practical operating purposes that is a per well basis?

A. Yes, sir.

Q. But you just don't know the formula or mathematical formula by which they work out their 2.32?

A. No, sir, except that I know it is so worked out when applied to all the wells that—

Q. Now, Mr. Hudnall—

Mr. Pollard:

I don't believe he has finished his answer.

Mr. Moody:

Pardon me.

A. That is the factor that when applied to all the wells in the field that have a potential of more than 860 barrels per hour will give you the 7,000 barrels of oil that is allocated on a potential basis.

Q. All right. Now, Mr. Hudnall, this schedule shows that every well—according to this proration schedule promulgated by the Commission and now in force in the East Texas Field, as I understand it, wells that will make—wells with a potential from one barrel per hour to wells with a potential as high as 860 barrels per hour are all allowed the same production?

A. That is correct.

Q. Now, then, do you know any reason why in order to prevent waste it is necessary to so allocate—to so promulgate and enforce this order, except just simply to hold the thing within the 522,000 barrels?

A. Well, I think that is the answer, if you are going to hold the field for a top allowable of 522,000, then I think it is necessary to distribute the oil in approximately the method that is used.

Q. All right, they could have stopped that thing down at wells from one to 500 potential?

A. How was that?

Q. From one to 500 potential and allow them twenty barrels and then spread the balance of it out by some other percentage factor among

the rest of the wells and stayed within the 522,000 barrels daily allowable without creating waste, couldn't they?

A. Well, if they had done that they would have had to lower the marginal from twenty barrels, which with the Saturday and Sunday shutdown amounts to fourteen barrels.

Q. Oh, no, you misunderstand me. They could have said every well having an hourly potential of 500 barrels shall be allowed to produce twenty barrels, and then they would say all wells, the balance of them after you find out how much oil that will be, and there is so much left, the balance of it will be prorated amongst the rest of the wells on some per cent factor and still stay within the 522,000? Of course, some of those better wells might have gotten a little less than twenty barrels or maybe a little more, but I am talking about from a standpoint of waste.

A. Yes, they could have done it that way without materially changing the waste factor.

Q. You can produce one of those—you can produce one of those wells over there that has 900 barrels an hour potential at a rate of fifteen barrels a day without creating waste, can't you, without injuring the well?

A. Oh, yes, you could do that.

Q. All right, so waste as you see it has no relation whatever to this line they draw under the 860 wells—wells of the 860 potential—waste as you see it has no relationship to the line they draw between all wells having 860 barrels hourly potential and wells having 865 barrels and more potential, waste has no relationship to the drawing of the line at that figure, at that particular place. It is a matter of how they are going to divide it up among them?

A. That is true providing you don't cut into your wells in your method down to less than ten or fifteen barrels a day.

Q. Those wells over there, lots of them are producing on ten barrels a day, are they not, and profitably? There are operators, at any rate, who continue to produce them when they have only ten barrels.

A. Yes, sir, they can operate them. They can't drill wells and operate them at that rate.

Q. Mr. Hudnall, under the production that has been over in the East Texas Field, with the price about \$1.10 a barrel, it has been a little above or a little below that over the last year or two, but it has ranged around that figure, has it not?

A. Yes, sir.

Q. And with twenty barrels a day and \$1.10 oil, one of those wells will pay out in a little over two years, will it not?

A. Yes, on twenty barrels. It will, of course, on ten barrels eventually.

Q. That is what I am talking about, on twenty barrels it will pay out in just a little over two years, will it not?

A. Yes, without the Saturday and Sunday shutdown. With the Saturday and Sunday shutdown I think it takes a little longer.

Q. Allowing seven days a week production, one of those wells, the driller, I mean the operator, will get the cost of drilling and equipping back in something like a matter of two years?

A. That is right.

Q. Now, how many wells did you say were drilled in 1936—1937?

A. During the year 1937?

Q. Yes.

A. A little over 2,000. I will have to get my records to give you the exact figure. During the year 1937 there were 2,351.

Q. 2,351. During 1938 how many were there?

A. 1,771.

Q. All right, that is about 4,000 wells?

A. Yes, sir.

Q. Out of 25,000?

A. Yes, sir.

Q. For the most part, the remaining 21,000 or 22,000 wells ought to have been paid for out of their operation long before this time, isn't that right?

A. Well, yes, of those that were drilled in the early part of 1937.

Q. Well, what I am getting at is this, you drilled in 1937 and 1938 approximately 4,000 wells?

A. Yes, sir.

Q. Well, that leaves about 21,000 that were drilled prior to that time?

A. Oh, yes, most of those would be paid out.

Q. I imagine of that 20,000 there, 21,000 there, there ought to be pretty nearly all of them paid out?

A. Most of them. Some on the pump wouldn't.

Q. Now, from the standpoint you were talking about, profitable operation of a well, after a well is paid out, why, it can be operated at a profit on an allowable from five to ten barrels a day, can't it?

A. You are cutting hairs pretty fine when  
524 you pinch wells down to five to ten barrels a day. They can be operated but not with much profit. I had one well on the west side of the field I had to abandon when it got down to ten barrels a day, and that was when we had a little better price than we have now.

Q. That was over in the water zone, wasn't it?

A. Yes, sir.

Q. You were having to take care of a good deal of water with your five barrels?

A. Yes, sir.

Q. All right, that complicated it considerably when it came to operating costs?

A. Yes, but there are some 3,000 or 4,000 wells making water that would have to be considered if you attempted to pinch those below ten barrels.

Q. Where you have water to deal with that complicates the thing, but wells in that field if they are paid out, they can be operated at a profit on some production of somewhere between five or ten or twelve barrels a day?

A. That is correct.

Q. Now, then, Mr. Hudnall, you stated that you thought the potential; the taking of the potential of a well, reflected certain of the facts, certain factors or certain qualities with respect to the property on which it was located. Will you mind explaining those again, please?

A. Porosity, permeability, pressure, structural position, the degree to which the sand itself is saturated with oil, and the amount of connate water.

Q. Now, let's see, pressure, porosity—

525

A. Yes, sir.

Q. Permeability.

A. Yes, sir.

Q. Degree of saturation.

A. Yes, sir.

Q. Connate water.

A. Yes, sir.

Q. And what was the other?

A. Sand thickness.

Q. Well, sand thickness and saturation?

A. Yes, sir.

Q. All right. Now, then, Mr. Hudnall, suppose this, suppose that I have got a tract of land that has ten acres in it and you have a tract of land adjoining it that has twenty acres in it, and I drill—our sand conditions are comparable both as to thickness, porosity, permeability and so forth, and that your pressures are comparable, and that I drill in my tract of land and I drill into the

sand three feet and you drill over on your tract of land the same sort of, using the same size drill bit, we equip them alike, but you drill down into that sand thirty feet, and so we put our two wells on a potential test, who is going to get the most oil?

A. You will get a little more oil.

Q. With three feet penetration?

A. No, the one with thirty feet penetration.

Q. You have thirty feet penetration and I have three feet.

A. I will get a little more oil.

526 Q. That little will get to be a good deal in time, won't it?

A. Well, of course, the permeability is a much bigger factor, generally speaking, than the others. You could have three feet of sand that could give you the maximum capacity; there or some wells in the field that had less than five feet penetration that made up above 800 barrels an hour.

Q. In the example I stated I am assuming that your tract—that the conditions with respect to pressure, porosity, permeability, sand thickness, saturation, position on structure, all of those things are equal, and your tract and mine are, they are so nearly equal we could call them the same thing for all practical purposes, but you take in thirty feet of sand in your well and I take in only three in mine.

A. Under most conditions thirty feet of penetration would get more and a little bigger potential.

Q. It would even get it if there was a little bit of advantage in either pressure or porosity or permeability as between—in favor of the well that didn't take in but a tenth as much sand?

A. Well, that is true, but it really isn't a big factor, generally speaking, in the East Texas Field.

Q. Now, of course, if the well with the larger bore is going to get more oil, a well with a larger bore is going to get more oil, isn't it, all factors being equal?

A. A little bit, yes.

Q. All right. Now, Mr. Hudnall, do you subscribe to the proposition that by taking the potentials of certain wells you can thereby draw lines and show just where the good wells will fall and the bad ones will  
527 fall, as it is done on that? This one here that has the red spots on it. This one. I am not talking about your map, I am talking about Exhibit 38, I believe, the Railroad Commission potential map. Yes, Exhibit 38. Do you subscribe to the proposition that by taking those potentials on those wells scattered around there you can draw lines and fix the potential?

A. You can draw lines that will give you somewhat the average potential of the averages in the wells in between the wells that the tests were made on. Actually if you tested every well you would get a little different picture.

Q. Well, as a matter of fact, even on this  
528 map and between these lines, it is a fact, is it not, that there are wells in between the 200 and 300 foot potential lines that are pumping wells today?

A. Yes, sir, that is true.

Q. And there isn't any machine made by which you can pump either two or three hundred barrels of oil an hour out of any East Texas well that has to be pumped?

A. I don't think they actually do that. There are a few wells on the west side where they pump 4000 barrels a day out of them.

Q. Twenty-four hours a day?

A. Oh, yes.

Q. Well, that is a good deal of difference between 200 barrels an hour and 300 barrels an hour.

A. 200 barrels an hour for twenty hours would be 4000 barrels.

Q. 4000 barrels?

A. Yes, sir. ◊

Q. 4800 for twenty-four. Now, there are some wells between the three and four hundred contours lines that are pumping wells; is that true?

A. Yes, sir, that is true, too.

Q. Now, do you know whether these potentials were taken as reflected here are the potentials that were taken in recent months or way back there a year or two or three years ago?

A. Those potentials were taken in October or November, 1935, I believe, maybe 1936.

Q. About three years ago?

A. Yes, sir.

Q. Now, Mr. Hudnall, I suppose you also subscribe to the proposition that though there may have been some reduction in pressures that if that field was closed in that the water drive would automatically restore those pressures to what they were, approximately?

A. It would in a geological period. It wouldn't in a year or two years or five years.

Q. What?

A. It would not, in my judgment, in five years time.

Q. It would not, in your judgment, in five years time?

A. I don't think so.

Q. You don't. That geological period is an indefinite sort of time to me. I don't know what a geologist means by that. Anyhow, it wouldn't do it in four or five years.

A. That is right.

Q. But there is, as shown by the box model, the first one introduced in evidence, there is a tremendous head of water bearing up against that oil sand from the west, isn't there?

A. Yes.

Q. And that water is there and being added to as time goes on, isn't that true?

A. Well, there is some addition to the volume of water at the outcrop, but I think it has no effect what-

soever on the East Texas field because there is sufficient volume anyhow within a radius of one hundred miles from that field before you get to the outcrop to give you an ocean of sand, the sand gets to be 600 feet deep and there are billions and trillions of water out there.

Q. And that water is pressing against that  
530 sand, and ultimately if you closed in the field and closed up all of the wells that would in time restore that pressure over there?

A. It would if you gave it time.

The Court:

Is that all salt water?

A. Yes, sir, varying in salinity as you get away from the outcrop, the saltier it gets.

Q. Now, do those pressures—I mean do those factors of—what about the porosity of this sand, does it change from time to time?

A. I think there is a slight diminution in the porosity of the sand when you lower the pressure. The exact amount of it, I don't know how to calculate, but I think there is a diminution in porosity.

Q. But it would be rather infinitesimal, wouldn't it?

A. If it were loose sand it would amount to considerable. If it was just plain beach sand, it would be a pretty large factor, but while in the consolidated feature, it isn't a very large factor.

Q. Now, Mr. Hudnall, do you subscribe to the theory that you can take pressure around on a few key wells and draw lines and thereby tell about what the pressures are over the field?

A. Yes. You have a pretty good idea on it, the more wells you take the more accurate map you get, but the pressure map is fairly accurate.

Q. So, if you were to close that field in and keep it closed in ultimately the water pressure would restore,

the force of the water would restore the field pressures substantially, as would be reflected by your potential map?

A. Yes, sir.

531 Q. I mean by your pressure map?

A. Yes, sir, it would do that.

Q. Now, then, if you took potentials, then your potentials ought to be the same as they were before, wouldn't they? You have the same pressure, you have the same porosity, you have the same permeability?

A. No, they—

Q. You have the same sand?

A. No, they would not be.

Q. They would not be?

A. No, sir.

Q. All right, you have the same pressures back, you have the same porosity, you have the same permeability?

A. Yes, sir.

Q. You have the same sand, you have the same position on structure?

A. No, that has changed very materially.

Q. Suppose you closed in. Now, you haven't moved anything up this incline as shown in this little Exhibit 33, the only thing that has come up is the water to restore your pressure?

A. You have taken out a billion and three hundred million barrels of oil, and when you open up an oil well to produce it, it is the expansion of that oil around the bottom of the hole that causes the flow. Now, if you decrease that volume you will decrease the amount that can expand around the bottom of the hole, and thereby decrease its potential.

532 Q. All right, you have the same pressures back, by closing in your wells the water has restored your pressures?

A. Yes, sir.

Q. And the only thing is your water table has risen and restored your pressure. Now, you were over there when Mr. Sterling closed that field in under martial law?

A. Yes, sir.

Q. And it was proved that the pressures built up?

A. Yes, sir, definitely.

Q. You were over there when the Railroad Commission closed it up a couple of times, weren't you?

A. Yes, sir.

Q. And it was proved that the pressures built back up perceptibly so?

A. Yes, sir.

Q. And it was closed under martial law for about thirty days?

A. It was closed in August 19th., and opened up September 5th.

Q. Under martial law?

A. Yes, sir.

Q. All right, in that period, that is not a geological age, is it, sixteen days?

A. No, but the physical condition in a large part of the reservoir is quite different now from what it was then.

Q. All right. Now, the Railroad Commission has closed it in some two or three times, two times, maybe three?

A. Yes, sir.

Q. And that was only for a matter of a week or two at a time?

A. Yes, sir, that is correct.

Q. And the pressures built up then?

533 A. Yes, they built up some in each case, but the rate of build-up, it starts off up and builds up very fast the first day and the second day a little less and so on until you approach a geological period of time to bring it back to its original.

Q. All right, if you closed in the field permanently would any of the 71 wells that are shown there as key wells, would any of those wells pass out?

A. I don't think so.

Q. You don't think so?

A. No, sir.

Q. All right, if you closed it in and they built back up their pressures, their potential ought to be the same, ought it not?

A. No, sir, it will not.

Q. All right, the factors are all the same, aren't they?

A. No, sir. I think I can explain it very concisely. You do not have as much oil under that field today as you had then, and the thing that causes a well to flow is the expansion of the oil, so if you don't have as much it can't expand as much.

Q. You have the Woodbine Basin that you can't change, can you?

A. Well, I don't think it would change as long as you had it filled with water.

Q. All right, it is there, you have the sand in there, and you have the underlying structures that control the position of the sand and now, then, the expansion of the oil, you say is the thing that enables the well to produce?

A. Yes, sir, that is correct.

Q. That is a factor in pressure alone, isn't it?

A. No, it is pressure times volume.

Q. All right, let me ask you this question, has  
534 that water drive got anything to do with the producing of oil in the East Texas Field?

A. Yes, sir.

Q. All right, the expansion or capacity of the oil to expand is a factor in pressure, is it not, but pressure is made up both of water drive and the expansive quantity, quality of the oil to expand?

A. Yes, sir, but of course, the volume that you have definitely is one of the factors that tells you how much it can expand. If you decrease that volume by a billion three hundred million barrels you couldn't possibly have the same amount.

Q. Don't you call these potentials, aren't they the same as you had in 1935, today you are using the 1935 potentials?

A. I think that is, so. I am not sure whether it is 1935 or 1936. I am sure the engineering department of the Commission could tell you the exact year.

Q. In any event, it is the pressure in the field that causes the oil to flow without the aid of pumps and things of that kind? That is a water drive field, isn't it?

A. Yes, it is part water drive. Now it is very largely water drive.

Q. Now, so far as oil expansion is concerned, that is just one of the things that go to make up the total pressure, isn't that right?

A. Yes, sir, that is true, but of course the pressure that I am talking about is the decrease in pressure when you open the well up.

Q. I understand that is what you are talking about, but I am talking about when you get those pressures back up there.

A. When you get them back up there, there will be a billion and three hundred million barrels less oil than there was before, and, consequently, those wells will not flow as much oil as they did the first time.

Q. All right. So, when you go to rate an oil field you consider volumes, do you not?

A. Oh, yes.

Q. I believe, Mr. Hudnall, that you have heretofore testified that there is a migration of oil from East to West in this field, haven't you?

A. Yes, sir, there is.

Q. All right. Now let's take this map right here, that is your Exhibit No. 40. You can see from there. I am just going to illustrate to you. This is your Exhibit No. 40. Now, this oil, according to your testimony—before I get—yes, I will start here. According to your—my understanding of your theory of this thing is that this oil, there is a migration of oil from east to west—from west to east?

A. Yes, sir, there is some migration in some areas; where the permeability is high there is more than in the areas where it is low.

Q. Now, as this oil migrates across here some one is going to gain and somebody is going to lose, are they not, under a per well allowable?

A. Yes, sir.

Q. As you take from all wells in the field substantially equal amounts of oil, going from the west to east somebody is going to lose?

A. Yes, sir.

Q. Somebody is going to get more?

536 A. Yes, sir, everybody that lies west of the approximate middle of the field is going to lose some and those lying east of the approximate middle of the field are going to gain some.

Q. These people over here are going to lose some?

A. Yes, sir.

Q. These people over here are going to gain some?

A. Yes, sir.

Q. These people on the west, the man on this lease, the C. H. Rhoades Lease is going to lose some oil?

A. It depends on what density his fee has been drilled up. If more densely than the area around him he may get more than he would lose by migration.

Q. In other words, if his lease is drilled to the average density, the owners on the Rhoades survey are going to lose some oil?

A. Yes, they would lose a little.

Q. All right. Now, then, over here on the John Rud-  
dell Survey are these people over here going to gain  
some?

A. Yes, sir, they will.

Q. All right. Well, take here the Rayne Survey, as-  
sume that is drilled to the average density, are they going  
to lose some oil?

A. Yes, they would lose a little.

Q. All right, the C. H. Alexander Survey, assume the  
same density, are they going to gain?

A. They will gain a little bit.

Q. So, somewhere between there there is a  
537 line and east of that line you are going to lose oil  
—if you are west you are going to lose oil?

A. Yes, sir.

Q. If you are east of it you are going to gain oil?

A. Yes, sir, that is correct.

Q. Now, then, this Railroad Commission order as it is  
written, contributes to that situation, doesn't it?

A. Yes, sir, any order that you would write and pro-  
duce the field on a practical basis would do the same  
thing.

Q. If you allowed them an equal amount per well per  
day, whether you did it with a figure of twenty barrels  
or a figure of forty barrels, anything that allows the wells  
to withdraw or on a per well basis per day, is going to con-  
tribute to a situation in that field where a man to the west  
loses, and a man to the east loses—I mean gains?

A. I think any order that—

Q. Now,—

Mr. Hart:

We object. Let the witness finish.

The Court:

Finish your answer.

A. I think any order that you put on the East Texas Field at all that would be practically the situation.

Q. All right.

A. Would also take from some, particularly those on the west side, and give to those on the east side.

Q. All right, this order doesn't attempt to relieve or alleviate that situation of loss of one man's oil and the gain of oil by another man, but rather it contributes to that? You have already testified to that, haven't you just a minute ago?

538 A. No, it doesn't attempt to adjust that.

Q. In fact, the fact that it gives each well the same amount is a contributing cause to it. I believe you state?

A. Well, I think that any method you would use would do that.

Q. I am not talking about any method, I am asking you where you give each well the same amount of oil that that sort of plan contributes to causing one man to lose and the other fellow to gain?

A. Yes, sir, it does that.

Q. All right. Now, Mr. Hudnall, take this tract, have you got a map here of this Rowan & Nichols Tract and Wood Tract?

A. Yes.

Q. Is it handy around here?

A. Yes.

Q. I thought maybe you might have one on a large scale?

A. I have a big scale map of it.

Q. Mr. Hudnall, let me ask you this question. Let me ask you this question, is the Wood tract, the well on the Wood tract at this time, gaining oil—draining oil from the Rowan & Nichols tract?

A. I think it is.

Q. Your answer to that question was you think the Wood well is draining oil from the Rowan & Nichols well?

A. Yes, I think it is.

Q. Now, Mr. Hudnall, you gentlemen made some reference about what time would do, and I think Mr. Cottingham, did you hear Mr. Cottingham's testimony with reference to what he called the time factor?

A. Yes, sir.

539 Q. All right. Now, Mr. Hudnall, there is nothing about the time factor, is there, that will straighten out the difference between Mr. Wood getting the same amount of oil per day off of a well on an acre or a well on a tenth of an acre, whichever it may be, and Mr. Rowan getting oil off of twenty-five acres drilled at a density of one well to five acres?

A. No.

Q. There is nothing in the time factor or time element that Mr. Cottingham talked about and that you have only slightly referred to that will equalize that difference, is there?

A. No, except in time Mr. Rowan may get a number of additional permits.

Q. But I am talking about right now, as the thing is right now?

A. No, as long as it stays like it is right now, there is nothing to compensate for that.

Q. All right, and as time goes on, if the drilling density remains the same and the per well basis of proration remains the same, the longer the time factor is the more the drainage from the Rowan & Nichols tract to the Wood's tract, isn't that true?

A. In total barrels, that is correct.

Q. Now, Mr. Hudnall, I believe you refer to this east Texas field as a common reservoir, do you not?

A. Yes, sir.

Q. I believe also you have made a sand thickness map on this tract of land haven't you?

A. Yes, sir, I have.

Q. And you are in the business, are you not,  
540 of having oil properties appraised, that is a part—  
you make employments to value oil properties?

A. Yes, sir, a great many.

Q. You have valued a many a one in the East Texas Field, haven't you?

A. Yes, sir, that is correct.

Q. And in valuing them you have estimated sand thickness and porosity and permeability and taken into account all factors including sand thickness?

A. Yes, sir.

Q. In valuing them?

A. Yes, sir.

Q. You have valued for people who wanted to buy, who wanted to trade, and for persons who wanted to lend money on oil production, haven't you?

A. Yes, sir.

Q. And in making those valuations you take into consideration sand thickness?

A. Yes, sir.

Q. In appraising how much oil there is there and what the person's property is worth?

A. Yes, sir.

Q. And you figure cubical content? In other words, you get three dimensions, you don't just get how much the well will flow, but you try to get the acre feet of oil underneath the lease?

A. I usually do, I don't always.

Q. Now, Mr. Hudnall, I will ask you, if you haven't testified that the—with respect to the East Texas  
541 Field—that if you attempt to distribute the allowable in such a way that you give each lease the oil that underlies it you must necessarily consider acreage?

A. Yes, if you want to try to do that instead of allocating it.

Q. If you want to give every man an equal opportunity to produce his oil, or the equivalent of the oil under his lease equal with everybody else in the field, you have to take into account some acreage factor, haven't you?

A. Yes. Of course, you may take it in with your well spacing program, the number of wells that would still give him the advantage, the opportunity, either the number of wells or acreage.

Q. In other words, under any other program or any program of proration that forgets that deprives one man and helps the other?

A. That is correct.

Q. You cannot do it and make the opportunities equal and forget acreage, which you may take into consideration by measuring the surface of the land or the density, you have to consider the volume the man has?

A. Yes, you have to consider the oil a man has within the well. I sometimes consider the value of properties within the drainage area, regardless of the wells.

Q. Now, Mr. Hudnall, you are talking about the East Texas Field here, we have been in all our examination?

A. Yes, sir.

Q. Mr. Hudnall, your sand thickness maps have been in the possession of the Railroad Commission for many, many months, have they not?

542 A. The first sand thickness map or one of the earliest sand thickness maps I made, that was in 1933, was exhibited at one of the state-wide hearings. Now, as to whether they had it, I don't know.

Q. It has been accessible to them, or they have had access to it at any time they wanted to see it?

A. Oh, yes.

Mr. Moody:

I want to correct myself before the Court, and in deference to Mr. Cottingham. I don't want to appear in a bad light. What I meant in speaking of the map was the map was available to them, Mr. Cottingham, I wasn't trying to reflect on you in the quarrel we had a few minutes ago. That is all.

The Court:

Do you have a map covering the entire field?

A. Yes, sir, I have a sand thickness map covering the total field. Not saturated sand thickness, but the Woodbine section.

The Court:

You testified, I believe, you consider that entire field a common reservoir?

A. Yes, sir, it is common in that there is some communication from one part to the other.

The Court:

You don't think it could be regulated separately?

A. Oh, it could be regulated separately, but it is pretty hard to find a point of demarkation.

The Court:

There is no line you could find to regulate one part one way and another?

A. There are no physical barriers where you could say this part should be this way and this another. It would be pretty difficult.

543

(At this time a recess was taken until two o'clock P. M. of the same day, when the following proceedings were had):

Re-Direct Examination.

Questions by Mr. Hart:

Q. Mr. Hudnall, Governor Moody asked you about the drainage from the Rowan & Nichols tract to the R. M. Wood tract. Under the present situation, during the period of a little more than six years during which Rowan & Nichols had from two to five wells drilled and operating on their tract, and when Mr. Wood had no wells on his tract, were Rowan & Nichols draining oil from Mr. Wood's tract?

A. I think they were.

Q. Could you give any estimate of how much oil was being drained from under the Wood tract to the Rowan tract during that period of time?

A. I think the Wood tract was drained to the extent of around ten thousand barrels per acre, and part of that was drained by the Rowan & Nichols wells and part of it by the adjoining wells to the north, south, east and west, so out of that Rowan & Nichols probably never got more than four to six thousand barrels.

Q. Have you examined the maps showing the locations of wells and computed the density of the drilling on a strip a mile wide from the Rowan and Nichols wells east to the east edge of the field?

A. Yes, sir, I have.

Q. Is the average density of drilling on that  
544 strip greater or less than the density of drilling on the Rowan & Nichols tract, counting the sixth well that has been granted by the Railroad Commission?

A. Counting the sixth well on the Rowan & Nichols lease, the density from their lease eastward from a strip a mile wide using it as the center of the strip, the approximate center of it, the Rowan & Nichols lease, is slightly less densely drilled than the Rowan & Nichols lease would be with the six wells.

Q. Taking an eight times folded area around the Rowan & Nichols tract, an eight times circular area around the Rowan & Nichols tract, are most areas more densely drilled or less densely drilled than the Rowan & Nichols tract?

A. They are less densely drilled than the Rowan & Nichols tract.

Q. If you take a half mile circular tract with the Rowan & Nichols tract as the center, is that area more or less densely drilled than the Rowan & Nichols tract?

A. It is less densely drilled.

Q. You take a three quarter mile circular area, is that more or less densely drilled than the Rowan and Nichols tract?

A. Less densely drilled.

Q. Take a mile circular area, is that more or less densely drilled than the Rowan & Nichols tract?

A. Less densely drilled.

The Court:

Is there any reason to go out in a fan shape that way.

Mr. Hart:

We just wanted to show the extent of the drilling, Your Honor.

545° The Court:

If you take a circle that is a mile wide, it is bound to include the other.

Mr. Hart:

Yes, sir.

Q. During the time that Rowan & Nichols has been more densely drilled than the surrounding tracts, has it drained oil to it from these other tracts?

A. It has had an opportunity to drain oil to it and I think it has drained some oil to it.

Q. And during that period of time has it acquired more oil per acre than the surrounding tracts?

A. I think it has, but I don't actually have the production figures on the other tracts, but just due to the fact that the allowable has always been essentially on a per well basis, if the other tracts had fewer wells per acre than had the Rowan & Nichols tract, why, the Rowan & Nichols tract would necessarily have produced more oil per acre and would have tended to drain the oil into it from these adjacent tracts that were less densely drilled.

Q. Now, Governor Moody asked you about the situation as to drainage from the west to east, and I believe you said in response to his question that any practical allocation would give some advantage to the leases to the east, is that correct?

A. That is true, considering just purely the water drive feature of the field. Of course, the east also is at some disadvantage in that the pressure decline, it declines faster over there than it does in the other parts of the field, so you have an abandonment that starts from both sides of the field.

Q. That is what I wanted to ask you. Govern-  
546 or Moody put a theoretical situation to you. As the actual situation exists all the areas on the east side of the field will be the last ones to receive the oil, or in the situation as it actually exists all the leases in the center of the field in the neighborhood of Rowan & Nichols will be the last ones to receive the oil?

A. The facts in the field up to the present time clearly show that certainly a great many wells will be abandoned on the east side of the field long before water ever gets there, and the exact position at which the final production will come from cannot be accurately determined at this date. My judgment is that it will be west of the Rowan & Nichols tract, slightly west of it rather than east of it.

Q. In other words, the Rowan & Nichols tract is in the vicinity in the field where the last production will occur, that is, where the wells will produce longest, is that correct?

A. I think so.

Q. Now, if you have a top allowable and you allow the present marginal allowance, then there necessarily won't be much to pro-rate on any basis, will there?

A. No, sir.

Q. If you adopted the method suggested by Governor Moody of giving the wells which were below the 500 barrel contour, that is which had an hourly potential of less than 500 barrels per hour—

Mr. Moody:

Pardon me, Mr. Hart, I didn't suggest that, I asked him if there is any reason why that couldn't be done. I wasn't advocating it, I was trying to find out if there was any reason for the 860.

547 Q. I will change the question. If the Commission should follow the plan which was referred to in the questions by Mr. Moody of limiting the twenty barrel per well marginal allowance to the wells that fell outside of the 500 barrel per hour potential contour, would that or not mean that wells toward the center of the field with higher potentials would get an allowance of less than twenty barrels per day? Do I make myself clear?

A. I don't believe they would get less than twenty barrels if you had a minimum of twenty on any of them, those in the middle of the field, located such as Rowan & Nichols—

Q. No, I didn't make my question clear, Mr. Hudnall. If you followed the method of allowing twenty barrels per day to the—only to the wells outside of the 500 barrel contour and applied strictly a potential allowance to

those with higher potentials, you didn't give them the minimum allowance, but applied strictly a potential method of allocation to the better wells inside of those contours, would you or not have the situation where some of the wells that had a higher potential than 500 barrels per hour would be receiving less than twenty barrels per day? The wells between the 500 and 860 contour?

A. You can't if you have a minimum of twenty barrels on any of them.

Q. I am not assigning a minimum of twenty barrels to those inside the 500 contour.

A. You would in that case, if you assigned a minimum of twenty barrels to all wells outside of the 500 barrel per well potential—per hour potential contour 548 . . . and then a percentage of the potential of the remaining wells.

Q. To the better wells inside?

A. To the better wells inside. Some of them would get less than twenty barrels, say down to fifteen barrels a day, and others would get up to maybe twenty eight barrels a day.

Q. In other words, if you followed that method of allocation you would be giving some wells that had higher potentials less allowance than other wells which had smaller potentials.

A. That is correct.

Q. Now, does the fact that most of the wells in the field get substantially the same amount of oil per day at the present time mean that the poorer wells will ultimately get as much oil as the better wells?

A. No, sir. Undoubtedly the poorer wells are going to be abandoned long before the better wells, and consequently the better wells will in some measure be compensated for the disadvantage that they are at now, by the element of time.

Q. Considering the increase of abandonments over drilling of new wells, which you have already spoken of,

will that mean that the rate of take by the better wells in the center of the field which go out of production last will be increased?

A. Yes, sir, I estimate that at the present rate of abandonment, plotting a curve on the rate of abandonments that within the next ten years, there will be around five thousand wells abandoned, something slightly over that. The allowable of these 5000 wells would be—at twenty barrels each—would be around a hundred thousand barrels. Now, this 100,000 barrels could be assigned to the wells in the middle of the field so that their allowable will increase as time goes on.

The Court:

Without waste of any kind?

A. Yes, without waste of any kind.

The Court:

Is it your idea that regardless of how few or many wells there are over there, you can take the same top allowable out of the field?

A. No, I think you would reach a point to where you would have to increase your top allowable. I think the more wells you drill, the more oil you get out regardless of how you operate.

The Court:

When these wells are cut down by abandonment would you still have this top allowable?

A. The top allowable is the commission's.

The Court:

You don't know what that will be?

A. No, sir, but I don't see any particular waste from restricting wells unless they are restricted to a point where they will be abandoned due to economic reasons, and then you will cause waste in my judgment.

The Court:

Now, does it necessarily mean that one of those wells that has to be plugged for the time being that that is an irretrievable loss and that it can't be opened up again?

A. The experience in most all fields has been, and I think it will follow in this field, that once a well is plugged and abandoned, it is never opened again. The probable operation in the future should the price of oil reach the point to justify further development would be they would drill new wells in between those that were abandoned. That has occurred in a number of fields.

550 Q. Have those wells which have been drilled between other wells that have been abandoned, have they produced oil?

A. Yes, in a great many fields where the old wells which have been produced to where they are completely depleted, new wells between the old ones have been completed and produced at commercial rates for considerable periods of time.

Q. What does that show about the drainage area of wells and about the regularity or irregular characters of the sand?

A. It shows that the drainage area—

Mr. Moody:

That hasn't happened in the East Texas Field. I object to it.

Q. Has that happened in the East Texas Field, Mr. Hudnall?

A. I know of one case in the East Texas Field where that has recently happened: Take the well that I owned an interest in myself was plugged and abandoned, and about three thousand feet northeast of it there was another well that was plugged and abandoned. The operator that owned a lease in between has gone in and gotten some

three or four flowing wells that make no water. Now, that condition does not exist generally. There are a few other areas where it has occurred.

### Re-Cross Examination.

Questions by Mr. Moody:

Q. All right, in the illustration you just used, the well you were interested in, you bit off too much sand and got some water and you couldn't get enough oil to justify the water you took in, and the same thing happened with the man up north, and what happened was you had drawn water in and trapped off the oil where the fellow  
551 went down and got it, the oil that was in the trap, that is the whole story of that isn't it?

A. No, the facts are when I drilled my well I stayed on the ground when the well was being drilled and we ran a steel measurement. When we got on the top of the sand we moved in cable tools and we drilled in one foot and quit. The well didn't make any water for about ninety days and then it started making water and never was produced at more than twenty barrels a day and the water encroached to the point where it had to be plugged and abandoned, and you couldn't have gotten any more oil out of it except at an economic loss.

Q. Whether you drilled twelve inches into the sand or twelve feet you were drilling at the water table, weren't you?

A. That is true, but there was another well that was located about a half mile northeast that got the top of the sand within one or two feet of the same level at which my well got the sand. That well produced over 500,000 barrels of oil; according to the information I have that is still a flowing well and making no water and my well is plugged and abandoned and gone.

Q. But the reason this man between your well and the other abandoned well who has drilled three or four wells,

the reason for that was there was a pocket of oil in there surrounded by water, isn't that true?

A. Yes, I think that is true.

Q. Now, there are one or two things I forgot to ask you this morning. One of them is that you calculate, do you not, oil reserves under lands and use the same formula that is used by—that Mr. Buck testified to from the witness stand when he was, on the witness stand, shown by the exhibit that is offered in evidence here?

A. I don't remember his formula, but I used, I am sure, a similar formula.

Q. That includes sand thickness?

A. Yes, sir.

Q. And you determined the cubicle content and taking into consideration other factors, porosity, permeability, and so on, and determined the amount of oil underneath that particular lease?

A. Yes. I usually limit it to drainage area of the wells rather than the lease in East Texas.

Q. Well, if you are figuring a well, but I am talking about, if I wanted to buy a lease from somebody and I called on you to estimate for me the oil wells there, you would undertake it wouldn't you?

A. I would probably set that up as I usually do in two ways—

Q. I don't care what ways you would—

Mr. Hart:

We object to counsel interrupting the witness. We ask that the witness be allowed to complete his answer.

Mr. Moody:

I am willing so long as he is answering my questions.

Q. If I asked you to calculate the reserves under there, you could do that all right and you would take into consideration sand thickness in doing it?

A. Yes, sir.

Q. Now, the other point that I had in mind to ask you about that I overlooked this morning was this. You are talking about getting oil at some—a man getting  
 553 his oil at some remote date far in the future. With oil now worth one dollar or \$1.10 a barrel, how much will that barrel of oil that is now worth \$1.10 be worth twenty years from now? I mean by that, tell me, compare the present value of a barrel in the hand that is worth one dollar, let me have that value twenty-one years from now or twenty years from now?

A. There is just one thing you will have to give me in that problem and that is the interest rate at which you are going to deplete that.

Q. You usually use six percent in depleting these values, do you not?

A. It depends on whether I am trying to arrive at market value or total net earning values.

Q. Suppose we take ~~six~~ percent, that is more customarily used than any other?

A. In the net earning value I say that is right.

Q. All right, suppose you take six percent. That would be about twenty one or twenty cents.

A. Close to it.

Q. Some where in the neighborhood of a sixth of what it is worth today?

A. Yes, sir, that is about right.

Q. Now, then, with reference to this morning you told me that if we had a good permeable sand, you and I had sands of equal permeability on our adjoining leases and equal pressures and so on and we drilled and you took thirty feet of sand and I took only three feet of sand that  
 554 your potential would be slightly higher than mine?

A. Yes, sir.

Q. That means to say, does it not, that if you have a permeable sand and all other factors are equal, why, a large amount of oil can be taken out of a thin sand as

well as out of a thick sand, providing a thin sand or a thick sand are both in contact with large supplies of oil?

A. That is correct.

Q. That is the principle you had in mind when you gave me that answer?

A. That is correct.

Q. All right. Now, then, based—let's apply that principle a little bit further. There are permeable sands on the east side of the East Texas Field are there not?

A. Yes, sir, there are.

Q. And there are sands that range in thickness twenty or thirty feet and on down to where they have five feet?

A. Yes, sir.

Q. All right, now you have testified that there are going to be abandonments on the east and on the west; the abandonments on the west are going to be caused by the encroachment of water, aren't they?

A. Yes, sir.

Q. The abandonments on the east side where you have a permeable sand and five feet of it on up to as far as you want to go, there aren't going to be many abandonments in that character of sand, are there?

A. The abandonments where the sand is permeable on the east side will be much less than where it is less permeable.

555 Q. I meant to say of the character of sand which I described?

A. Yes, sir, I so understood it.

Q. And where you have twenty feet of sand on the east side of the field, you have some permeable sand that will last for a good long while, haven't you?

A. I think that is true in there near the Rowan & Nichols lease.

Q. It is true all along in there isn't it?

A. No, from Kilgore south the permeability is reduced to where it is low.

Q. All right, from Kilgore south, that is less than the south half of the field?

A. Pretty close to the south half.

Q. The Court asked you this morning if you could have one rule for proration in one part of the field and another in another. The Railroad Commission did at one time did divide the field that way, didn't they?

A. They did before the fields were all connected, when that field was first discovered.

Q. Didn't they run a line through the Post Office at Kilgore and say all south of this line is in one section of the field and north is in another section of the field?

A. Yes, in the early life of the field the first well that was drilled was in the extreme end of the field—

Q. Well, pardon me, Mr. Hudnall. To try to refresh your memory, didn't they do that as late as 1933?

A. No, sir.

Q. It was earlier than that?

A. No, sir, the only time that order prevailed was in 1931 and it prevailed at the time there was three  
556 separate pools. No one knew where they were  
going to connect or whether they were going to connect.

Q. Well, the present order does not take into account the difference between the characteristics in the south end and the characteristics in other parts of the field?

A. Yes, it does in that that south end of the field where there is a lot of shale the potentials of the wells are much lower.

Q. Well, except as the per cent of 2.32 is figured on the last 7,000 barrels of oil out of 522,000 the existing order doesn't take into account any difference between the condition in the south end of the field and the conditions in the other ends of the field, in other parts of the field?

A. No, the practical application of the order does not. The basic principles of the order does.

Q. All right, so far as the man who has his well in the south end of the field that will make twenty barrels of oil a day, he gets within five barrels of the quantity allocated to the best well in the field, although he is in a poorer part of the field than the best well in the field?

A. That is true.

Q. All right, then, those differences are not taken into account?

A. No, sir.

Q. All right, and the fact that many wells in this more inferior part of the field are allowed to produce the same amount of oil as the better wells in other parts of the field has the effect to give the man with the better well a—  
or put him at a disadvantage as compared with the men

557 who have their wells in the poorer part of the field, they being allowed to produce substantially the same amount of oil, that results, doesn't it?

A. That is true.

Q. So a fellow in the best part of the field, where he has the most permeable sand the most oil and all those things, and is held to produce substantially the same amount of oil to a man in the south end where he has less sand and less permeability, a man in the north is placed at a disadvantage by this, he is at a disadvantage to the man down where the property is not so good?

A. That is true.

Q. That obtains all through the field?

A. Yes, sir.

Q. That affects Rowan & Nichols?

A. Yes, it does.

Q. And affects them disadvantageously?

A. Yes, at the present time.

Q. Now, let me ask you another question or two. You told Mr. Hart that you thought that Mr. Rowan and Nichols—the Rowan & Nichols lease would be somewhere about the place where the field would last go out?

A. That is true.

Q. Mr. Hudnall, I am afraid that you left your testimony before the Court as expressing it to be your opinion that wells over there where they have thirty or forty feet of sand on the east side of that field would be abandoned. You didn't mean to leave any such impression as that, did you?

553 A. Throughout most of the fields that is true.

I won't say I think it will be true in every case because in some areas they have a gravel bed that extends—

Q. I am talking about the east part of the field where they have thirty or forty feet of sand. You don't mean to intimate that those wells are going to be abandoned?

A. Yes, I think they will before Rowan & Nichols wells will.

Q. But that is a long time off?

A. That is true.

Q. Now, then, you said in your testimony there that you thought that their wells were in the territory that would last produce. That is just an estimate that you made from the general overall picture, isn't it?

A. That is true. The data that that is based on, generally speaking on, is this, the rate of abandonment up to the present time show that there is about two thirds on the west side and one third on the east side. Well, if that continues throughout the life of the field, then the final place of abandonment will be one third in from the east side and two thirds up from the west side.

Q. Well, Mr. Hudnall, you know that is not going to be the case in the face of your testimony that this oil keeps moving east all the time and you have pretty thick sands to the east and you have water coming from the west?

A. I think, generally speaking, that is going to prevail. Now, the testimony hasn't brought out as clearly as it probably should on that point what the situation was, but the wells on the east side are abandoned from the lack of pressure.

559 Q. All right.

A. The lack of pressure.

Q. I thought you said from the lack of permeability?

A. The lack of permeability causes the lack of pressure, but in the final analysis it is the lack of pressure. Now, the whole field dropping at the rate of some thirty pounds a year, it is obvious as the low pressure areas are always on the east side of the field that as the pressure drops on down to where the wells will not make their twenty barrels that wells that are located on the east side of the field will reach that stage long before the Rowan & Nichols wells.

Q. Let's see if I get your logic. Two thirds of the wells are being abandoned on the west?

A. That is correct.

Q. One third on the east?

A. Yes, sir.

Q. Therefore, the abandonment will move in, two thirds of the territory abandoned will be on the west and one third on the east?

A. Yes, sir.

Q. That is your philosophy?

A. That is exactly.

Q. Because there have been twice as many wells abandoned on the west, of the wells abandoned, two thirds were on the west and one third on the east, therefore the territory over which that abandonment will take place over the life of the field will be two thirds on the west and one third on the east.

A. Yes, sir, that is the way it will be.

560 Q. I want to ask you this question. On the Rowan & Nichols lease the sand thickness,—the sand beyond, the sand east of their lease is thirty feet higher to the top of it than it is on the Rowan & Nichols lease, isn't it?

A. Yes, sir.

Q. There is thirty feet more sand—this Court Room is about eighteen feet, twenty feet high, I guess, the ceiling. It is as deep as from the floor of this Court Room, the floor of this Court Room to the ceiling and then a third on up, the sand is that much higher than Rowan & Nichols on east?

A. Yes, sir.

Q. And it keeps on going until it pinches out?

A. Yes, sir.

Q. Judge McMillan asked you if the fact they plugged a well, if that meant they never would operate it again, or some question to that effect. You answered him on the basis that the well had been plugged, didn't you?

A. Yes, sir.

Q. Your idea was that it had had cement pumped in it down there?

A. Sure.

Q. When the Court used the word plugged?

A. Yes, sir.

Q. Now, if the Court had used the word closed in, your answer would have been different?

A. Oh, yes.

Q. You can close a well in, leave it closed in a long time without doing it any harm and open it up again?

A. You can do that.

Q. Now, you said that you thought, in answer  
561 to Mr. Hart's questions, that back before this Wood well was drilled that Rowan & Nichols were draining some oil from the Wood's lease?

A. Yes, sir.

Q. All right, whatever may have been the condition in the past with respect to that, it will never be the same again as long as the Wood well is producing from a tenth of an acre or an acre out of one well and Rowan & Nichols is producing five wells off five acres—five wells off twenty-five acres and each is allowed the same daily allowable.

Whatever the condition in the past was, that condition never will exist again, will it?

A. I don't think so.

Q. And from here on out, as it is prorated on this present basis, Wood will be draining oil from Rowan & Nichols?

A. I think he will.

Q. Let's see your figures there on density. What is this, how is this figured, the top one? Is that in a circle?

A. No, it is the first mile east just laying out a square mile.

Q. A square mile?

A. Yes, just laying out a square mile.

Q. And the center of the west mile of the square mile would be about in the center of the Rowan & Nichols lease?

A. That is right.

Q. And the density there is one well to five acres?

A. That is correct.

Q. For all practical purposes the same density as Rowan & Nichols?

A. Yes.

Q. You figured with this on six wells, didn't you?

A. In answer to the question. The question put it at six wells.

Q. We are trying it on five wells. There have been no six wells drilled. Now, the second mile east was drilled to a density of one mile to four acres?

A. Yes, sir.

Q. All right, so the average density of the two miles to the east would be four and a half acres wouldn't it?

A. Yes, sir.

Q. All right, now you take your folded area eight times the size, the average density there is greater than the density of the Rowan & Nichols isn't it?

A. Yes, with five wells.

Q. It is greater than the Rowan & Nichols?

A. Yes, sir.

Q. All right, you take your area—wait a minute, all of your areas, if you take your eight times the folded area, you mean by that an area of land that in reality there are three tracts the same size of the Rowan & Nichols tract across the top end, that includes the Rowan & Nichols, and three across the bottom means nine tracts, doesn't it? It means nine areas, including Rowan & Nichols that are the size of the Rowan & Nichols?

A. That is correct.

Q. All right, now, if you take that way of figuring and Rowan & Nichols with five wells on the edge of those—each of the other eight areas is drilled to a greater density than the Rowan & Nichols lease?

A. Yes, on an average.

Q. It is drilled, the Rowan & Nichols, one well to five acres and in that area the average density is one well to four and a quarter acres?

563

A. That is correct.

Q. All right. Now, when you take a circular area, put a point of the compass at the center of the Rowan & Nichols area and describe a circle nine times the size of the Rowan & Nichols, including the Rowan and Nichols—

A. This calculation only refers to the area that would be outside of the lease.

Q. All right, and the density there, they are drilled to a greater density than the Rowan & Nichols?

A. That is correct.

Q. Then, if you take a half mile or three quarters of a mile or a mile circle, just as far out as you have gone, the drilling density is greater than the drilling density on the Rowan & Nichols lease at this time?

A. Yes, sir.

Q. With five wells on it?

A. Yes, sir.

Q. All right, and if you go on to the west with your square miles, when you get way out to the fourth square mile, I mean to the east, the fourth square mile to the east, that even is drilled to a greater density than Rowan & Nichols?

A. Yes, sir.

Q. In other words, on all of the figures you have on this sheet, the only place where you show any area that is drilled to a less density than the Rowan & Nichols is the third mile east of the Rowan & Nichols tract, and  
564 that is just one-one hundredths of an acre less in density of drilling than the Rowan & Nichols, isn't that right?

A. That is correct.

(The above referred to instrument was thereupon received in evidence and marked Exhibit 42.)

Q. Now, then, if you are right that this oil is moving from east to west and also you said this afternoon again it was—west to east I mean.

o The Court:

West to east, isn't it?

Q. Yes, sir. The fact there is a greater density of drilling east of the Rowan & Nichols tract on the average than the density of the Rowan & Nichols tract, that is going to aggravate, is it not, the hurt that Rowan & Nichols get from drainage by reason of this migration of oil?

A. Yes, sir, it will.

Q. Now, this proration order, per well allowable, doesn't make any allowance for this except as it is reflected by this potential factor which figures on 7,000 barrels out of 500,000?

A. That is right. It is Rule 37 that takes care of that.

## Re-Direct Examination.

Questions by Mr. Hart:

Q. All of those questions which Mr. Moody just asked you with reference to density assumes that Rowan & Niehols chose not to take advantage of their permit to drill their sixth well?

A. That is true. If they took advantage of that they would be greater drilled than any of these areas except the second mile east.

Mr. Moody:

I thought you asked him on five wells.

565 Mr. Hart:

I wanted to make it plain that it was five wells you asked about.

Q. Governor Moody asked you about a proration scheme dividing the East Texas field into more than one unit. I will ask you if that isn't a proration scheme which was applied by a central committee of operators rather than the Railroad Commission?

A. I think the Central Proration Commission is the one that sponsored the scheme. I think the Railroad Commission probably adopted some parts of it, but as soon as the Commission really took the field over to operate it themselves, it was considered as one field.

Q. Now, Governor Moody asked you about what the value of the oil would be if you were not able to take it out for some years if you discounted the value according to a rate of interest. Would there be any effect on the value of that oil if all the operators were allowed to draw all the oil on their leases at the same time, if they wanted to draw it out, what would be the effect of that?

A. I think it would decrease, based on past experience, to seventy-five cents, or fifty cents a barrel.

Q. If everybody should run open as much as they wanted to?

A. Yes, sir, it would drop to that pretty quick.

Mr. Hart:

I believe that is all.

The Court:

I want to ask this witness a question or two. I still have this matter in my mind. It may not be pertinent to the case, but still I would like to have it for the purpose of the record. There are some fields in Texas where the regulations are different as applied to different parts of the field, are there not?

566

A. I don't know of any, but there may be.

The Court:

That may not be true with regard to oil fields, but certainly it is true with regard to the gas fields.

A. I think probably the Statute covers certain regulations with respect to certain gas fields.

The Court:

Now, if you approached this field not with the market demand in mind at all, but simply with a view to eliminating underground and overground waste, is there any valid reason why restriction could not be made in the regulation of certain parts of the field where the field was ragged and poor, couldn't it be regulated according to its merits, and where it was better they could regulate it according to its merits? Is there any reason why you couldn't do that?

A. I don't know that there is.

The Court:

Do you have to treat them all alike?

A. I don't think so.

The Court:

Can you differentiate between them?

A. I think so, and the only thing I think would have to be considered from the viewpoint of preventing waste would be the minimum of reduction in allowable for certain wells, below which if you restricted them would be plugged and abandoned. Outside of that measure, which would be applicable to the poor wells, I see no reason why the better wells couldn't be given a better allowable.

The Court:

It is all just a question of how much you get out, isn't it?

567 A. That is true.

The Court:

Do you think an order could be written, then, that would differentiate between the wells on the basis of their capacity and reserve and that sort of thing?

A. Yes, sir, I think it could be, but I sure think it would go above the 450,000 barrels or 400,000 barrels a day, which in my judgment wouldn't hurt.

The Court:

As I understand your testimony it wouldn't hurt that field to go above that?

A. That is right, that is what I think.

The Court:

Do you think the amount fixed now is too conservative?

A. I think probably it is too tight.

The Court:

Is your eye fixed on market instead of conservation?

A. I think so. It is a little tight.

The Court:

All right, do you gentlemen want to ask him any further questions?

Mr. Moody:

No further questions.

### Re-Direct Examination (Continued).

Questions by Mr. Hart:

Q. Mr. Hudnall, this schedule Governor Moody introduced in evidence, does that take into account wells which have been drilled since the permit was given to Rowan & Nichols to drill their sixth well?

A. Yes, this schedule takes into consideration the development as of January, 1939.

568 Q. It includes wells drilled between March, 1938, and January 1, 1939?

A. Yes, it does.

### Re-Cross Examination.

Questions by Mr. Moody:

Q. Mr. Hudnall, if you cut those—put those wells at ten barrels instead of twenty barrels, then your five hundred twenty figure could be held the same or brought below it, in connection with your answers to the Court?

A. Yes, you could do that, but you couldn't drill any more wells, you would completely stop development on ten barrels minimum a day.

(Witness excused.)

Mr. Hart:

We wish to offer in evidence the map which was identified as Exhibit 40, and the schedule which was marked for identification as Exhibit 41.

(The above referred to instruments were thereupon received in evidence, having heretofore been marked Exhibits 40 and 41, respectively.)

Mr. Hart:

We would next like to offer in evidence the original proration order based on percentage of the potentials of the wells, dated April 22, 1933.

The Court:

Isn't that attached to the pleadings?

Mr. Hart:

No, sir. I understand, however, that they intended to offer it, but it hasn't been. This is the original potential order of April 22, 1933.

Mr. Tocker:

That has been offered as Exhibit 18.

569 Mr. Hart:

I next wish to offer in evidence the order of January 31, 1933, changing the spacing rule in East Texas from a 20 acre unit to substantially the present rule of 660 feet and 330 feet.

(The above referred to instrument was thereupon received in evidence, the same having heretofore been marked Exhibit 44.)

Mr. Hart:

We next wish to offer in evidence the order of September 27, 1935, with reference to the making of potential tests. This has been testified to to some extent by witnesses who have testified.

(The above referred to instrument was thereupon received in evidence, the same having heretofore been marked Exhibit 45.)

Mr. Hart:

We would next like to offer in evidence the order of December 6, 1935, with reference to the taking of potential tests.

(The above referred to instrument was thereupon received in evidence, the same having heretofore been marked Exhibit 46.)

Mr. Hart:

We would next like to offer three orders of the Commission, pro ration orders, dated, respectively, August 26, 1935, February 24, 1936, and March 23, 1936. We have only one copy of these and we would therefore like permission to withdraw the originals and substitute copies.

The Court:

You are just offering these for the purpose of the record or are they supposed to have some actual pertinence to the matter that might influence the Court in some way?

Mr. Hart:

I think they have some pertinence.

570 The Court:

Do you wish to state those?

Mr. Hart:

I would like Mr. Pollard to state those.

The Court:

I don't want you to go into great detail, but I would like to know the general nature of them:

Mr. Pollard:

The August 26, 1935, order, your Honor, was the order which contained a recitation that an acreage times po-

tential order for prorating oil on a ten acre unit of spacing had been presented to the Commission and considered by it. It likewise discussed a portion of the decision in Brown vs. Humble Oil & Refining Company with respect to the ability of engineers to ascertain with a reasonable degree of accuracy the oil content. It makes an administrative finding, based upon all of the testimony and expert witnesses which they had heard at their various hearings, that it is impossible for them, the Commission, to ascertain with that reasonable degree of accuracy necessary to allocate this order on an acreage—on a basis of acreage times potential as suggested. It further provides in there that they have made an administrative finding from the evidence that the more wells that are drilled the greater will be the ultimate recovery of oil and gas from any given pool.

Mr. Moody:

What is that date?

Mr. Hart:

August 26, 1935.

Mr. Moody:

Your Honor, I didn't know what the order was about. I object to it because it is hearsay and self-serving and immaterial and irrelevant to any issue involved in this case.

571 The Court:

I should think it would be admissible as an order. It wouldn't be admissible as proof of any of the facts.

Mr. Hart:

We are offering it for the purpose of showing the findings that have been made by the Commission and the orders entered by the Commission.

The Court:

It doesn't follow, of course, that those facts are true, but I think it is admissible to show that an order of that character has been made.

Mr. Moody:

I am going to object to it, your Honor, if offered for the purpose of showing that an order of that character has been made. I object to it in this case because in this case it is self-serving and then I object to it altogether and for all purposes if it is offered to prove the truth of any of the facts therein recited or for the purpose of showing that there was evidence to support them.

The Court:

I think that objection would be good, if it is offered for that purpose.

Mr. Pollard:

It was just offered, your Honor, to show the finding that is made and the administrative finding made by the administrative body in pursuance to the hearings which it had held with these matters at issue and dealing with its spacing rules. There has been some contention made that this is an arbitrary ten acre spacing limit. This order goes to show, as well as does the development in the field, that that isn't what it is at all.

The Court:

I think the Courts frequently consider the various orders they have made and the steps they have gone through in trying to arrive at some equitable way of doing those things. They are admissible for that purpose. Still, on the other hand, if you are offering this order for the purpose of proving the truth of those recitals I don't believe that is admissible.

Mr. Pollard:

No, sir, we are just introducing them to show the administrative findings of the Commission.

Mr. Moody:

I object if he is offering to prove the administrative findings. I think they are immaterial to show the order is made, but certainly they are not admissible to show the findings.

The Court:

I will admit this for the purpose of showing such an order was made and I will make the statement that so far as this Court is concerned I wouldn't consider it as proving as true the facts it purports to find.

(The above referred to instrument was thereupon received in evidence, the same having heretofore been marked Exhibit 47.)

Mr. Pollard:

The second order, dated February 24, 1936, contains a recitation to the effect that whereas in their previous order dated August 26, 1935, there was contained the following language, and they quote it, "We further find from the evidence the more wells that are drilled the greater will be the ultimate recovery of oil and gas from any given pool." And then they proceed thus: "By this language the Commission did not mean and did not find from the evidence that the closer wells are drilled the greater will be the ultimate recovery of oil and gas from any given pool, but by such language only meant and found from the evidence that the more wells that are drilled

572. in conformity with the spacing rules as applicable to the various fields in Texas the greater will be the ultimate recovery of oil and or gas from any given pool." This order further recites, "It was not then the

intention and it is not now the intention of the Railroad Commission to abrogate or abandon any of the spacing rules now in effect and applicable to the various oil and gas fields in Texas, nor to militate against the fact basis on which the Commission's spacing rules are based."

The subsequent order of March, the date being March 23, 1936, again contains that same recitation. In explanation, if it may bear some light on it, my interpretation is that there had been some question of the unrestricted-more wells more oil proposition. The Commission apparently by the second order—at least it is our purpose in introducing it, and our position by the second order is that the Commission applied that finding to the spacing rules with their exceptions as applicable to the various oil fields in Texas, including the East Texas field.

Mr. Moody:

We have a different understanding of it. I take it that this is not the time to discuss our understandings, or does the Court want to hear our understanding?

The Court:

No, I don't want to hear your arguments now.

Mr. Pollard:

If the Court please, I would like to get these marked, and these happen to be my personal certified copies; and we will substitute other copies that are exact and get the Court reporter to mark these.

574 The Court:

What is the pertinency of these orders? Are they supposed to throw some light on the construction or application the Commission gives to the present order?

Mr. Pollard:

Yes, sir. The contention has been repeatedly made by the plaintiffs in this suit that the spacing rule is a minimum spacing rule, that is, one providing for arbitrary minimum limits below which wells could not be more densely drilled upon tracts of less than ten acres. The Commission's interpretation and findings with respect to it show to the contrary. The field itself shows to the contrary; and it is for that purpose, to let the Court see for itself the Commission's findings and interpretation of its own orders.

The Court:

All right.

(The above referred to instruments were thereupon received in evidence and marked Exhibits 48 and 49.)

Mr. Hart:

We next wish to offer in evidence the orders of the Railroad Commission on the application of R. M. Wood on a one acre tract. I offer these for the purpose of showing the action of the Commission on these. There has been a good deal of talk on this and we offer them.

The Court:

Substantially what are they?

Mr. Hart:

They show that the application of R. M. Wood for a permit, on that the Commission finds that it should be granted to prevent confiscation of property; under the exception to Rule 37 he is granted a permit to drill his well on his one acre tract. Then there is an order on a motion for rehearing filed by the Shell Petroleum Company on which the Commission granted a rehearing and then

there is an order reaffirming the permit which  
575 had theretofore been granted to Wood to prevent  
confiscation of his property.

Your Honor, I have a schedule showing the density of  
Wood's tract as compared with the surrounding leases.  
There has been some testimony—

Mr. Moody:

I object to that because I don't know who prepared that  
or anything on earth about it. "Sun Oil Company's Exhibit  
2." I object to that, your Honor, because that is hearsay.  
It is just simply something that someone filed in that  
case. It purports to be a representation of their conten-  
tion of certain facts.

Mr. Pollard:

If the Court please, that was introduced by the pro-  
testant Sun Oil Company at the hearing before the Rail-  
road Commission on Rowan & Nichols' application and  
introduced without objection at all from the applicant  
Rowan & Nichols and constitutes a part of their file on  
their application for Well No. 6, and was otherwise sup-  
ported by the attached plat which was certified to.

Mr. Moody:

If it is offered as something that is in the files of the  
Railroad Commission I object to it because it is imma-  
terial. If it is offered to prove the matters therein stated  
I object to it because it is hearsay.

The Court:

Sustain the objection.

Mr. Hart:

Note the exception. We offer these in evidence. They  
have been identified.

(The above referred to documents were thereupon received in evidence, the same having been heretofore identified as Exhibits 43, 50, 51 and 52.)

576 Mr. Hart:

Now, if the Court please, there has been some evidence which has been elicited from the witness Hudnall by questions from the Court about the top allowable in the field. I understood from statements made by counsel for the complainant and by complainant's witnesses that the top allowable of the field had not been questioned. For that reason we have not put any evidence on with reference to that.

The Court:

I think you are right about that. I think Mr. Rowan testified himself he was not objecting to the top allowable. But I raised the question myself because it is a pertinent question in any of these cases. As a matter of fact, it furnished most of the litigation to begin with, the question of the top allowable, the question as to whether it was really a conservation measure or whether it was made to meet the market demand. Now, if it is a question that has come to rest and nobody controverts it any more, that may be another story, but if as a matter of fact this arbitrary top allowable as fixed has no reasonable relationship to the prevention of waste then to my mind it becomes very material in regulating these people here.

Mr. Hart:

I may say that if it is considered by counsel for the complainant and by the Court to be an issue in this case or grounds of attack on the order of the Commission we are prepared to sustain the order on the ground that it is a waste prevention measure. On the other hand, if it is not an issue—

The Court:

I would be willing to abide by what they say, whether they tender it as an issue. I raised the matter myself. I don't know whether they are raising that question or not.

577 Mr. Hart:

I don't understand that it is raised by the pleadings. If it is I would like to put on evidence about it.

Mr. Moody:

Your Honor, Mr. Rowan I think stated our view, or rather the position of the lawsuit. He testified he was not attacking in this lawsuit the 522,000 barrel allowable, and that is the testimony that Mr. Rowan gave, and our pleading, I don't think, attacks it. The pleading attacked the method of distributing that allowable.

Mr. Hart:

All right, with that explanation then we understand it is not an issue, the top allowable is not an issue, and we won't offer any evidence on that. The defendant rests.

(At this time a recess was taken, at the conclusion of which the following proceedings were had:)

578 E. V. FORAN, a witness for the Complainant, having been first duly sworn, testified on rebuttal as follows:

### Direct Examination.

Questions by Mr. Moody:

Q. State your name, please, sir.

A. Mr. E. V. Foran.

Q. Where do you live, Mr. Foran?

A. At San Antonio.

Q. What is your business?

A. Consulting petroleum engineer.

Q. Please state your educational training and experience as a petroleum engineer.

A. I am a graduate of the University of Idaho, 1921, in mining engineering, and from June, 1922, to June, 1924—1925, correction—was with the Mid-West Refining Company in the Salt Creek Field, Wyoming, in general production practice, both gas and oil and gasoline plant work, and in 1925 and 1926 with the United States Bureau of Mines in the Rocky Mountain Division, Salt Lake Field, Wyoming, supervising the Bureau's activities regarding conservation on the public domain, of which the entire Salt Creek Field was a part of the domain. From August 26th to the present date a resident of Texas, in which time my profession carried me through the Panhandle Field—

579 Q. Pardon me, August 26th, you mean August, 1926?

A. August, 1926, correction. At which time my work carried me into the Panhandle Field on well completions and production practice, both oil and gas. Since that time in practically every major field in Texas at some time or another on production practice, well completions and conservation work. In general production practice, including appraisal work and reports and examinations for both development and production.

Q. Mr. Foran, you have been here in the Court room and heard the testimony in this case, have you not?

A. Yes, sir.

Q. Mr. Foran, it has been the contention of the defendant in this case, as I understand, that although at the present time the order may be operating—first, before I ask that question, you are familiar with the present plan of proration as it is applied and enforced in the East Texas Field, are you not?

A. Yes, sir.

Q. As I understand, it is the defendant's contention that even though that plan may at present operate to prevent Mr. Rowan or Rowan & Nichols recovering from their lease, the one described in this evidence, in proportion to the amount of recoverable oil under their lease, or to enjoy an opportunity along, equal with that enjoyed with other operators in the field to recover the recoverable oil or its equivalent, that although that may be happening at this time, nevertheless that time will take care of that situation and ultimately Mr. Rowan or Rowan & Nichols will from their wells on their Todd lease recover the equivalent of all the recoverable oil under the lease, that the time element will even the thing off. You have heard that theory?

580

A. Yes, sir.

Q. Is it your view that if there is any disadvantage being suffered at this time by Mr. Rowan or Rowan & Nichols, that time will take care of that so he will ultimately recover the equivalent of all the oil under the Rowan & Nichols Todd lease?

A. No, sir, time in the future will not take care of that situation.

Q. All right, sir. You saw the Plaintiff's Exhibit No. 12, did you not?

A. Yes, sir.

Q. Presented by Mr. Buck?

A. Yes, sir.

Q. Mr. Foran, will you step to the blackboard there and illustrate for us and explain why in your opinion the time element will not take care of the disadvantage that we contend that Rowan & Nichols, the Rowan & Nichols lease has suffered?

A. Yes, sir, I will produce an approximate sketch of this for the purpose of illustration rather than precision.

Q. You are referring to Exhibit 12?

A. Yes, Exhibit 12, which is a cross section diagram of the East Texas Field from a point to the west edge of

the field to the west of the Rowan & Nichols lease to a point to the eastern-most part of the field east of the Rowan & Nichols lease. This horizontal lower line represents the minus 3,320, which was the indicated initial water table in the East Texas Field. The section 581 enclosed by the irregular line above that represents a cross section area which is somewhat similar to the drawing, but not exactly. For purposes of illustration, however, I believe it will indicate. If the cross section be divided into twelve equal units. Now, there are twelve—divided into twelve segments whose horizontal distance or horizontal measure is the same, but whose vertical measure, is variable, and therefore, the cubical content would vary proportionately. If the displacement force from the field is working—displacement force from the field is working from the west to the east at low rates of flow or low rates of displacement the water table will slowly rise as oil or other fluid is taken out from the levels above the water table, and at very low rates of take, such as the East Texas Field is subjected to today, that water table rise will be reasonably horizontal. It may have local irregularities, but if you take the large areas across the field the mean rise of the water table will show somewhat proportionate to the oil displaced, because of the reason that pressures are practically constant in the face of taking some 522,000 barrels per day out of the field for five days, and we come to the fact that those displacements are taking place at almost constant pressure, which indicates that the displacement is taking place of practically the same order as that of which the oil is being taken out, and under such conditions in a field whose sand is permeable on an average as this one the water table rise on an average will be horizontal. It is true that local irregularity may cause local rises, but the mean effect is a somewhat level displacement. Then if we take 582 the water table rise for the time the water has risen to where it is at the top of the sand to the

eastern limit of the first segment, it will represent throughout the pool a displacement of something of that character, in which I have shaded in solid chalk. Under those conditions the oil, or substantially all of the oil in the first segment, underlying that surface acreage, has been entirely displaced by the water, but the second segment still has some left. The third has some more, and so forth, until you get to a point to where it is at the base of the sand, where the water table intersects the base of the sand, which is in the eastern side of the field. From there on to the eastward no displacement by water has taken place and consequently no depletion will have taken place. If pressures are constant or if pressure drops somewhat negligibly any degree of depletion is slight as compared to the original oil in place, and the original recoverable oil in place is there, or its equivalent.

Q. Now, in the meanwhile while this first segment is being drained out if you have a per well allowable, each well allowed to draw practically the same, the wells here and the wells here have all been getting the same amount of oil?

A. Yes, sir.

Q. But this fellow's well is gone and this fellow has some left?

A. Yes, sir, from this point eastward no depletion has taken place. From this point westward total depletion has taken place. Intermediate points, intermediate percentages of depletion or its equivalent have taken place.

On further continuing the process, by the time  
583 the second segment, third, fourth and the following segments, as they are also displaced by water, all properties to the westward of the eastern limit of the water are suffering a certain amount of depletion, while those to the eastward of that limit will still be suffering no depletion, although each one of them gets the same quantity of oil, and so on as the water rises upward to the following segment and as it does so those segments to the

eastward are still empty or free from any depletion while those to the westward as far as this point have suffered total depletion, and the amount that each segment will make over an equal area will depend on how much to the eastward or the westward they are to that medium point or neutral point which determines whether or not the amount of recoverable oil is greater or less to the original recoverable oil in place, and as depletion continues on the sum of the total recoverable oil can be calculated from the relative volumetric ratios of these areas. Knowing their original ratios and the fact they get the same amount of oil out during a time period, it becomes obvious that progressing on to the eastward the time factor is in favor of those to the eastward and against those to the westward. In stating the rate of displacement it may be at half this rate, which will take double the time for recovery, or any other variation of rate, but that would not alter the manner or sequence in which the displacement takes place, and knowing the total amount of oil that may be recovered or that will be recovered from each of these segments under those conditions it easily becomes determinable whether the sum total recovered equals more or less than the initial oil in place, and in the case of the Row-

584 an & Nichols lease it indicates that the ultimate recovery would be less than that which was originally in place, were the present method of allocation in the East Texas Field to continue of the same order.

Q. Now, Mr. Foran, let me ask you a few questions. That is simply the application of physics to a physical fact existing in the East Texas Field?

A. Yes, sir.

Q. Of principles of physics?

A. Yes, sir.

Q. If you are letting these areas produce equally this area gets, until it is drowned out, we will say, a hundred barrels of oil a day, and this one a hundred?

A. Yes, sir.

Q. This one is drowned out which was getting a hundred, and this one continues to get a hundred?

A. Yes, sir.

Q. And that is an illustration of the migration to the east?

A. Yes, sir.

Q. There is a zero line through here, we will draw it here, let's call that zero; somewhere in that field there is a line west of which they lose oil and east of which they gain oil?

A. Yes, sir.

Q. Under proration?

A. Yes, sir.

Q. You didn't prepare this drawing or make the calculations, did you?

585 A. No, sir.

Q. You have been over it?

A. Yes, sir.

Q. You know the principle upon which it was worked out?

A. Yes, sir.

Q. And you have illustrated that in your testimony before the Court with your diagram?

A. Yes, sir.

Q. From your study of it you take it to be approximately a correct representation of the facts that indicate the life of the field?

A. Yes, sir.

Q. I believe that shows the Rowan & Nichols tract in an area that will lose approximately eighteen percent or twenty per cent of the oil in place?

A. Yes, sir.

Q. Under this present plan of proration?

A. Yes, sir.

Q. So this thing they call the time factor, then, will it or not, in your opinion, take care of the present disad-

vantage that Rowan & Nichols, the Rowan & Nichols lease is suffering under the existing proration order?

A. No, sir, not under the existing order.

Q. Well, I don't believe—I have assumed that it was suffering a disadvantage. Is it your opinion that the Rowan & Nichols Todd lease, under the existing order, is suffering a disadvantage as compared with other leases in the field in the opportunity which this order and its application gives to that lease or the wells on that lease to produce the recoverable oil under that lease or the equivalent thereof?

A. Yes, sir.

Q. You believe it is suffering?

A. Yes, sir.

Q. You think that the application and enforcement of this order against the Rowan & Nichols Todd lease deprives them of an equal opportunity with other operators in the field to recover the recoverable oil or the equivalent thereof, under their respective leases?

A. Yes, sir, I do.

Q. You think that this order as it is enforced and applied against Rowan & Nichols deprives Rowan & Nichols in the operation of their wells on the Todd lease, prevents Rowan & Nichols recovering their proportionate share of the recoverable reserves in the common reservoir?

A. Yes, sir.

Q. Then they are suffering a disadvantage all around?

A. Yes, sir.

Q. In your opinion are the five wells that Rowan & Nichols have on their lease, the Todd lease, if they were given an equal opportunity with others, in your opinion would the five wells be sufficient to drain the oil under their lease?

A. Yes, sir, I believe they would.

Q. That is if they had an equal opportunity with other operators in the field?

A. Yes, sir.

Q. And would it cause waste, the fact that they only had five?

587 A. No, sir.

Q. Now, this present order that they said is based upon potential or potential method of allocating the field allowable amongst the wells, do you think that that method of allocating the allowable or prorating it among the wells or allocating it among wells, do you think it is a true potential method or—I will state it this way: is the Commission accurately applying a true potential method in the production of this field?

A. Not to all wells, no, sir, not except to a very minor extent.

Q. Well, now, if the Rowan & Nichols lease is given, allowed to produce on its true potential, have you calculated about how much it would be allowed to produce daily?

A. Yes, sir, I have.

Q. How much?

A. If they were allowed to produce daily an amount of oil proportionate as their daily potential bears to the field's daily potential, they would be allowed to produce 160.7 barrels daily.

Q. Instead of that they are producing about 111?

A. 112, I believe it is, approximately.

Q. Now, when you say that you are talking about the potential the Railroad Commission gives them as shown on the map?

A. Yes, sir, as shown on the potential schedule.

Q. They are getting about 49 barrels less than what they are entitled to if they were applying a true potential factor of allocating field allowable amongst wells?

A. Yes, sir.

588 Q. Do you think that if that—if the plan they are now applying, as it continues through the years, do you think that will—you say it is now injuriously affecting Rowan & Nichols as compared with the opportunities others have?

A. Yes, sir.

Q. Do you think that injury will grow less or increase as time goes on? What is your estimate of that?

A. Well, I believe the injury will increase as time goes on.

Q. All right, now, Mr. Foran, do you think that a potential test taken on the Wood lease, the Wood tract of one acre, and a potential test taken on one of the wells drilled on the Rowan & Nichols twenty-five acre tract, would reflect anything about, just—just the potential alone, reflect anything about the relative amount of oil under the two tracts?

A. No, sir, it would not.

Q. You would have to take acreage into account?

A. I think you would if you are dealing with a quantity of oil.

Q. And you would have to take sand thickness into account, would you not?

A. Yes, sir.

Q. Now, Mr. Foran, in your opinion can the wells in the East Texas Field be reduced to say ten barrels per day without creating waste or damaging the wells or causing premature abandonment of the wells or causing the loss of oil that otherwise would be produced?

A. I would. Yes, sir, they could.

Q. Mr. Foran, in your opinion, can a method of pro-rating—

The Court:

Pardon me, what was that last question? I would like to get that.

589 Mr. Moody:

Whether or not in his opinion the wells in the East Texas Field could be reduced to ten barrels a day without causing damage to the wells, premature abandonment of the wells or the loss of oil that otherwise would be produced.

The Court:  
All right.

Q. And I add to that waste, do you think it could be done without waste?

A. Yes, sir.

Q. Mr. Foran, in your opinion, can other methods than the one now applied by the Railroad Commission be adopted for prorating or allocating among wells in the East Texas Field the daily allowable that will not result—that will reduce the inequalities that result from the enforcement of this present order as those inequalities affect Rowan & Nichols?

A. Yes, sir, I believe so.

Q. Are there one or more ways that you think could be adopted? I don't care to go into it.

A. I think there is more than one, all right.

Q. Of allocating the oil that would give the operators a more nearly even opportunity to recover the oil underneath their leases, or the equivalent of it, and would reduce, if not do away with, the inequalities that such persons as Rowan & Nichols are now suffering under the present order?

A. Yes, sir.

### Cross Examination.

Questions by Mr. Hart:

Q. Mr. Foran, I believe you testified that if Rowan & Nichols were allowed a daily allowable of—in the proportion that their potential bore to the potential of the field, that they would be given a daily allowable of 160.7 barrels, is that correct?

A. That is approximate, yes, sir.

Q. Their present allowable is about 111 barrels a day, isn't it?

A. That is right, 111 or 112, yes, sir.

Q. And if they drilled a sixth well that they have been given a permit to drill their allowable will be increased to 133 barrels, would it not?

A. If they drilled another well it would, yes, sir.

Q. Now, in figuring this 160.7 barrels a day did you assume that there would be no marginal allowance or did you assume that there would be a marginal allowance of a certain amount, or did you just distribute the whole total potential in the proportion their potential bore to the whole field?

A. I based it on a ratio of their potential to the total field potential.

Q. Yes, sir.

A. Purely on a potential basis only.

Q. Purely on a potential basis only?

A. Yes, sir.

Q. And that would give them that 160—that would give them only 160.7 barrels per day?

A. Yes, sir, that is right.

Q. Now, assuming that they had six wells, that is that they drilled their sixth well, and they had an acreage density of one well to about 4.16 acres, which is somewhat greater density than the average of the field, I believe that has been testified?

591

A. Yes.

Q. And you took in account acreage times potential in allocating the allowable, then by reason of the fact their density is somewhat greater than the density of the field as a whole, they would get a somewhat smaller allowance per day, would they not?

A. Just offhand I couldn't tell you.

Q. Wouldn't that follow from the fact their density is greater than the density of the field, that is, that they have fewer acres per well than the field as a whole?

A. Not at all, no, sir. I wouldn't say. It seems to me if they drilled another well their potential would increase at the same time their density decreased, and I did cal-

culate the acreage times potential against the other and found them almost identical, and therefore I say that, without calculating it, just as an approximation, that there would be no difference and I would just consider it an unnecessarily drilled well and would neither add to nor detract from the present situation.

Q. You don't mean if they drilled another well they wouldn't get a higher potential, a higher allowance under the present scheme of proration?

A. They would, but less than if they were on a straight potential at the present time.

Q. Now, Mr. Foran, I would like—

The Court:

Would the fact that they drilled another well arbitrarily give them so much more allowance? What would happen to your top allowable then?

Mr. Hart:

Yes, it would give them more under the present system of allocation.

592 The Court:

Wouldn't that affect the top allowance?

Mr. Hart:

The drilling of one well and the allocation of more allowable to that one well would increase the total allowable in the field.

The Court:

And the total allowable is fixed?

Mr. Hart:

From month to month by the Commission, yes, sir. And I might say in accordance with the findings that the Commission makes with regard to the amount of oil that can

be produced and still keep the pressure from dropping at too rapid a rate.

Q. Mr. Foran, I would like to ask you one or two questions about this diagram you have drawn over here. How far is it, Mr. Foran, from the western edge of the field to the eastern edge?

A. I beg pardon?

Q. How far is it from the western edge of the field to the eastern edge?

A. If I know the approximate scale of one of these maps—what is it approximately, eleven miles across here?

Mr. Cottingham:

Eight and a half.

A. Approximately eight and a half miles.

Q. That will be satisfactory, I don't care to have it exact. About what is the distance from this line up to the highest point on the structure that you have there?

A. I believe 130 feet, I believe 130. By that I mean the highest contour on it. To the water table is 130 feet, I believe, as shown on the contour maps. 3,350 feet, the top contour, minus 3,220, it is 170 feet then, approximately 170 feet.

593 Q. Well, in rising from the present level—is that the present indicated level or the original?

A. That was the original, minus 3,320.

Q. The water will have to travel upward 170 feet, and in order to get to the east edge of the field it will have to travel eastward about eight and a half miles, is that right?

A. Its upward movement automatically carries it eastward. I wouldn't say it would have to carry it that far, because it is already here at this position about halfway across. I say approximately, from here to over there.

Q. Now, I don't suppose it would make any difference in the ultimate result, of course, but this map is drawn,

this sketch is drawn on an entirely different vertical scale from horizontal?

A. Yes, sir, it is an exaggerated vertical scale.

Q. It greatly exaggerates the difference in the levels of the Woodbine sand?

A. Not in proportion.. It does in scale, but not proportion.

Q. Actually if you drew them to the same scale the East Texas Field would be a very thin scaly line like this?

A. That is right, yes, sir.

Q. Now, Mr. Foran, your testimony—this is one of the facts which is brought out by your testimony, is it not, that there is a certain advantage of position which the persons who own tracts on the eastern half of the field, of the East Texas Field, have over persons who own tracts in the west half of the field, under the ratable system of taking from the field?

A. Yes, sir, that is true.

594 Q. Would that same advantage, in your opinion, exist under unrestricted—under conditions of unrestricted production?

A. Yes, sir, but of a different order. That is inherent.

Q. If the Railroad Commission didn't do anything, let them drill and produce as they wanted to, unrestricted conditions, the position on the structure would still have to be considered in determining how much oil would be produced from a lease, is that correct?

A. That is true, with one exception, because of the great thickness of the sand in the fairway they would probably pull on wells with high rates of flow without sustaining injury, whereas thinner sections close to the edges would not be so fortunate. The fairway would have the advantage. It is merely a magnitude of the relative advantages, but the principle is the same.

Q. The principle is the same?

A. Yes, sir.

Q. Now, if you were going to let the men in each segment recover the recoverable oil in place in their particular segment without losing any oil at all to the sections to the east, could you do it in any way without, say, closing off the field all except a certain sector and letting the wells in that sector draw all of the wells' oil?

A. That is true, that would be the only way to do it.

Q. That would be the only way?

A. Yes, sir.

Q. Now, Mr. Foran, this illustration ignores, does it not, the differences which may exist in the structure and which would prevent the even and regular horizontal rise of the water table in the East Texas Field?

595

A. Would you say that again, please?

(The reporter thereupon read the last preceding question.)

A. I would not say taken as a whole across the field. No, sir. I think that it illustrates the manner of displacement.

Q. Doesn't it assume this, that say that the field, if there is no drainage except from west to the Rowan & Nichols tract?

A. This does not—I don't understand you.

Q. Maybe I can make my point plainer. Let's look at this map here, this structural map here. By reason of the fact that this particular area here in which the Rowan & Nichols tract, I believe, is about on the edge, by reason of the fact that it is a high point and that lower points are around it to the north and west and the south, will there not be drainage by reason of the water drive to that area from the north, northwest, west, southwest and the south?

A. I think so, I think there will be displacement across there from any places or directions of higher existing

pressures, whether it happens to be north, south, east or west, as long as those areas maintain pressures higher than those on the Rowan & Nichols; I would say the gradient would be in that direction.

Q. Then they are more favorably situated, not only than the tracts to the west of them, but also more favorably situated than owners to the north and south of them, are they not?

A. Not appreciably so, not in proportion to their thickness here. In proportion to the thickness there I would say they have a better tract of land and therefore  
596 are entitled to recover more oil than those sections.

Q. I don't think I asked you that question, Mr. Foran.

A. I thought you asked me were they more fortunately situated. I said yes, sir, because they were higher and more oil than these others; I think so.

Q. Now, when you speak of a man having a better tract of land do you take into consideration only the thickness of the sand under his tract, or also take into consideration his position on the structure and position in the field?

A. Yes, sir, I take the position on structure and in field in addition.

Q. In other words, any allocation that would disregard natural advantage on structure would disregard a factor you consider an element in valuing a man's land?

A. Yes, sir, I think position on structure is an element contributing to the value of his land, yes, sir.

Q. Now, Mr. Foran, let's look at this chart over here again a minute. I believe that there was some testimony by Mr. Buck that the indications are that instead of the water level rising horizontally in this fashion, as you have drawn these lines, that the water level is rather tilted in somewhat, this manner and is rising along this way, gradually rising higher as it goes along the bottom of the Woodbine sand. I understood that to be the manner in which he said the water level would rise.

A. If it would rise that way you would expect it to be higher water on the east and lower on the west.

Q. If it rose in that way would or not the disadvantage that you are speaking of to the Rowan & Nichols lease be decreased rather than increased?

597 A. I say it would still be decreased.

Q. The disadvantage?

A. I beg your pardon. You asked me would the proportion of the disadvantage be decreased or increased?

Q. Yes, if it would go somewhat like this. Have you figured that out?

A. They would still have the same relative disadvantage as before.

Q. That wouldn't make any difference?

A. No, because those to the east and west of them would bear the same relationship to this inclined table as to the horizontal table.

Q. Now, supposing you find in the east edge of the field here not permeable sands but by reason of the fact of certain facts that are indicated by certain information you have that these sands over here to the east are relatively impermeable and for that reason this pressure is not transmitted to them and the wells on the east side of the field go out of production before the wells here in the center of the field. Would that not indicate the disadvantage that you are speaking of under this situation where the sands are relatively uniform would not exist in the case of the Rowan & Nichols tract?

A. Well, I can't—I can't assume—I can't conceive of good permeable sands which are connected to the main pressure reservoir, the common reservoir, going dry when they are constantly being displaced by a medium of the same type of liquid to the west of them.

Q. Would you answer my question on the hypothesis that I gave you, or do you say you can't answer on that hypothesis?

598

Mr. Moody:

Mr. Hart, I suggest you let him answer your question. He said he couldn't conceive of that condition existing.

Q. Could you answer that on that hypothesis or not?

A. That was an assumption?

Q. Yes, sir.

A. Assuming that these sands were too impermeable to allow the liquid to come into it?

Q. No, that it was so impermeable that the pressure was not transmitted over there and this area goes out of production.

A. That is the same. If that is your assumption, then my answer is yes, they would not be replenished, if they could not maintain their pressure I mean.

Q. All right, and then this portion of the field where the thick sands and permeable sands are located would be the last portion of the field to produce oil?

A. Well, how far out are these impermeable sands from the east side, are they just on the outside?

Q. Don't ask me questions.

A. No, I am very willing to answer every question, but I can hardly assume that these impermeable sands are anything like—anything other than rather a border on the east half.

Q. I am just asking you for information, Mr. Foran. I don't know how far they extend, but I am assuming, in accordance with some of the testimony, that that portion of the field will go out of production; then if we assume that then it will follow, will it not, that the portion of  
599 the field west of that where the permeable sand exists will produce longer than any other portion of the field?

A. If you are speaking through the Gladewater and Rowan & Nichols lease I say the gradient is very flat, and therefore cannot concur with your assumption.

Q. Now, Mr. Foran, I believe the evidence is that this lease is producing, has produced about 358,000 barrels of oil up to the present time?

A. Yes, sir, I believe that is it.

Q. And the water level has risen only ten feet. Is the rise of the water level in proportion to the amount of oil withdrawn?

A. I would assume that it must be, since those pressures are maintained.

Q. Well, the Rowan & Nichols has withdrawn from about a fourth to possibly a third of what was estimated to be the recoverable reserves under the lease?

A. That is true, yes, sir.

Q. That is at the present rate of withdrawal. Now, how long will it take the water level to get up to where it will drown out the Rowan & Nichols lease, at the present rate of withdrawal, if it has risen about ten feet in the past eight years?

A. You mean how long will it take to rise to the top of the sand under their lease, completely displace it or merely enter it?

Q. Put them out of production.

A. Clear to the top of the sand where the displacement is complete? I believe they are some 130 feet above the water table, the top of the sand.

Q. I can't answer your question.

600 Mr. Moody:  
3,180 is the top.

A. That is 130 feet—140 feet, and if it has only risen ten feet it will rise another 130 feet.

Q. At the present rate of total withdrawal?

A. Sir?

Q. At the present rate of total withdrawal from the field how long will it take the water to rise and drown out the Rowan & Nichols lease?

A. I couldn't calculate that for you right offhand because the area covered by the water under the field increases as time goes on and its rate of rise may vary for that reason.

Q. Could you estimate the time it would take for the water table to rise up to the Rowan & Nichols lease?

A. Well, I would say that as time goes on, due to the fact that the oil producing area of the field becomes lessened and lessened for the same amount of oil withdrawn, the water table, the rise would accelerate, and offhand I couldn't give you a figure, but as the acreage shrinks for the same displacement the water table will rise faster.

Q. You couldn't tell us exactly what that would be, of course. I believe you said that. Mr. Foran, let me ask you just one more question. When you calculate the recoverable reserves of a lease do you calculate those reserves on the basis of the amount of oil within the confines of the lease, if they were extended down into the earth, or do you count on the structural position of the lease so that it will drain some oil from surrounding leases?

A. If I am calculating the reserves in place  
601 I am calculating only the reserves underlying the acreage, that is, the reserves in place.

Q. Well, now, has the water level gotten to the Rowan & Nichols lease?

A. No, sir, not to my knowledge.

Q. Do they or not have the same amount of oil in place under their lease at this time that they had when they drilled their first well?

A. Practically the same, very little less.

Q. Very little less?

A. Yes, sir.

Q. Now, Mr. Foran, I believe that there has been some mistakes about the exact position of the Rowan & Nichols lease. Do you know whether it is actually farther to the west or farther to the east of the center of the

line or center of the section of the field in which it is located? You take an east-west cross section of the field here where the Rowan & Nichols lease is located, are they farther—are they on the east or west of a line drawn halfway through that cross section?

A. A line drawn halfway through?

Q. Drawn through the center of this cross section, are they on the east side or west side?

A. Just that linear distance, I would say that—I would say that they are on the eastward of that line as I lay it across there.

Q. They are in the east half of the field then?

A. Yes, sir, if you take a geographical dividing line they are in the east half of the field.

Q. Well, as you pointed out they get drainage from all that portion west of them, which is more than half of the distance across the field at that point, and in addition they get the drainage from the north up—

The Court:

That is repetition.

Mr. Hart:

That is all.

#### Re-Direct Examination.

Questions by Mr. Moody:

Q. Mr. Foran, while you are up there, there has been a lot said about this high, and this pink here is the high, I assume. That line over here, that crosses Rowan & Nichols, east of three wells, they are west of the line, and two to the east of it?

A. Yes.

Q. This is the 3,180 foot contour line?

A. Yes, sir.

Q. As you go on east this keeps getting higher?

A. Yes, sir.

Q. And according to this contour map they have here from the top of the Rowan & Nichols sand over here to the next contour line or to the next high place over there there is thirty feet, it is thirty feet higher over here than it is over here on the Rowan & Nichols tract?

A. Yes, sir.

Q. All right, now, they have talked about these wells being abandoned. Nobody knows of any wells being abandoned over there that have thirty feet of sand in them, do they?

A. Not if it is permeable, no, sir.

603. Q. And no one knows of any that has ten feet that is permeable being abandoned?

A. No, sir. I beg pardon, I make a correction. On the east side—that may be correct on the west side, but if you are speaking of the east—

Q. I am talking of the east.

A. Yes, sir.

Q. Mr. Hart asked you in discussing the diagram to suppose that the sand was impermeable back over there. It is a known fact, is it not, that that is a permeable sand?

A. Yes, sir.

Q. Producing oil out of it every day?

A. Yes, sir.

Q. Have been for seven years?

A. That is right.

Q. With reference to whether there is a third or fourth of the estimated recoverable reserves under the Rowan & Nichols tract which has been produced, that depends on what you figure on, does it not?

A. Yes, sir.

Mr. Moody:

Mr. Hart, when you said a third to a fourth of the estimated recoverable reserves have been produced from the Rowan & Nichols land, you had in mind the lower figures?

Mr. Hart:

According to the estimates Mr. Rowan and his experts have given at different times, yes, sir.

604

Q. Now, Mr. Foran, you were asked, I believe, I asked you if there were other methods of allocating this field allowable among wells that would reduce the disadvantages that the present one causes to some operators, including Rowan & Nichols, and you said there were. I am not undertaking to commit you to any one of them or your honor to commit plaintiff to any one of them, but in order that the Court may have before him something as to what you have in mind, name some of them.

A. You could take potential, times acreage, which would give—which would tend to lessen the prevailing inequities and it would not introduce new errors, because acreage can be determined exactly, and I think these potentials, if you assume they are reasonably correct, but the acreage is exact.

The Court:

Is that East Texas Field so constant that you can be sure the acreage is the same? For instance, a man might have a good well on a large piece of acreage, one part of his acreage have a good well and the balance of the land be no good.

A. Within the confines of the field the density is so fairly well developed—

The Court:

You say you can multiply potential by acreage?

A. Yes, sir. My basis for that is this, if those potential wells are representative of potentials in the East Texas Field, and there are only seventy-one, or one to every 1,800 acres, I would certainly feel I was staying within the bounds of accuracy if I took any acreage within that 1,800 and applied it equally to it, because apparently they are supposed to be representative of 1,800 surrounding acres.

Q. Mr. Foran, if the potential will do what  
605 the Railroad Commission engineers claim it is, that is reflect reserve, if it is accurate for that purpose, one man has one acre here, another man has a hundred here, if you will multiply the potential that they say does reflect, if it does what they claim for it, if you multiply it by the acre here and a hundred here, then taking their own yardstick, that fairly reflects it; doesn't it?

A. That is the only conclusion you could draw.

Q. Isn't that a fairer way to get at it?

A. Yes, sir.

Q. Assuming they are right, say here is a man with one acre and here is one, if it reflects what is under the land, then, potential times the acreage would be a fair way, if they are right?

A. Yes, sir. They reach out to cover 1,800 acres on an average, and assuming that to be uniform, and if we assume potentials reflect reserves, we must assume uniform reserves. Therefore, reserves are directly proportionate to acreage.

#### Re-Cross Examination.

Questions by Mr. Hart:

Q. Well, the potential reflects the productive capacity of the wells?

A. Why, that is what it is, the productive capacity of the wells.

Q. And you measure potential by taking what a well will flow and not the number of acres around a well?

A. Then—

Q. Just answer my question, isn't that correct? Repeat the question.

606 The Court:

Ask the question over again. I didn't hear your question.

Mr. Hart:

The question was, you determine potential by seeing how much the well would produce and not by counting the number of acres around the well, isn't that correct?

A. That is correct.

Q. Now, when you say acreage times potential would reduce this inequity which you spoke of you are assuming that the marginal allowance is eliminated, are you not?

A. No, sir, I believe that you could keep an allowance, a marginal allowance, and still above that marginal allowance apply this acreage times potential factor.

Q. But if you keep the same marginal allowance and only prorated the Rowan & Nichols lease and all other leases on the basis of acreage times potential instead of potential alone, because of their density, the density of their drilling, Rowan & Nichols would not be benefited any more by acreage times potential than by potential?

A. That is if you maintain the same twenty barrel marginal.

Q. And the same total allowable?

A. And spread it over all of the wells who made above the marginal.

Q. No, you keep the same marginal allowance for all the wells that will make that much and the same top allowable?

A. Yes, sir.

Q. The same system now except you prorate the balance above the marginal and allowable on the basis of acreage times potential instead of potential alone, in the case of Rowan & Nichols, by reason of the fact that they are more densely drilled than the average of the field as a whole, they would not benefit by a change from a potential basis of allocation to an acreage times potential method of allocation?

A. Why, if you keep the same margin as you have right now for all wells you have a hundred per cent well system. That is inconsistent. I can't reconcile the reasoning of the question. If you have twenty barrels to every well over there now and the 522,000 allowable you have a ninety-eight and one-half per cent per well right there.

Q. Well, would Rowan & Nichols be benefited or not by the change I have spoken of?

A. I don't know, it would be so close that it would take precise mathematics to tell it.

Mr. Hart:

That is all.

Mr. Moody:

That is all.

The Court:

I have some questions. Let's get down to the question here of whether it is necessary to have the marginal allowance to really produce that field without any loss or waste. What, in your view, is the proper thing to be done with regard to those lame duck wells that can't make very much? Do you have to give them a handicap of the

kind the Commission gives them to properly produce the field? It is a sort of a handicap, isn't it?

A. Yes, sir, it is an inherent proposition that can hardly be overlooked.

The Court:

What is your view about that?

A. Well I think that their marginal in the case—

The Court:

Not with regard to your view or that the man has put his money in it, but looking at it from the standpoint of the public and the idea of preventing waste, have they got to be considered and given this preferred position, or can they be disregarded?

A. No, sir, no more than a dry hole or uncommercial wildcat, because it is evidently a risk and those types of wells are confined to reasonably well known areas in the field.

The Court:

Suppose you treat them so harshly they have to quit. How much will the state lose by reason of that quitting?

A. They would undoubtedly, but—may I answer—

Mr. Moody:

You mean in oil that can't be produced? You are not talking about taxes?

The Court:

I am talking about how much oil would be eventually lost if these weak brothers were disregarded.

A. I don't think they would lose very much. If they are so weak they only produce a few barrels a day in the face of those that produce thousands of barrels—they do not represent a large or any important percentage of the ultimate recovery of the field. I do not think that they

should be major issues in dealing with the rest of the field, as it is, because of their minor importance, but it would not be my recommendation to overlook or to not to grant them an advantage. Wells of that type, there is only a few of them, and I think under those conditions they might be, if for no other reason for it but custom, it would be my recommendation to grant them the advantage.

The Court:

As I understand it, there are 463 of those wells.

609 A. Yes, sir, that is approximately. Some of them are water bearing wells on the west side which I think should be looked at in somewhat a different light than those on the east side. That problem of the marginal well can't be looked at alone from one side. I think it is more intelligent to look at the water wells on the west side with one view and those on the east with another, because their problems are different.

### Re-Direct Examination.

Questions by Mr. Moody:

Q. I believe the testimony was those 463 wells produced approximately 5,000 barrels per day, or one per cent of the total daily allowable, isn't that correct? Do you know, Mr. Cottingham?

Mr. Cottingham:

I didn't understand.

Mr. Moody:

Those sub-marginal wells, 463 or 467 of them, produce about one per cent or a little less than one per cent of the daily allowable?

Mr. Cottingham:

The report I have as of February 1st of this year shows that there were 451 sub-marginal wells which had assigned to them 5,250 barrels, or  $11\frac{1}{2}$  barrels per well.

### Re-Cross Examination.

Questions by Mr. Hart:

Q. I would like to ask a question or two along that line. Now, Mr. Foran, when you consider the marginal allowance you have to not only consider the sub-marginal wells, that is the wells that can't make more than twenty barrels a day, but you also have to consider a marginal allowance for all the other wells up to—

610 Mr. Moody:

Pardon me, I object to that because it calls for a conclusion of law.

Mr. Hart:

I am asking him about the question of waste.

The Court:

He hasn't finished his question.

Q. When you talk about the marginal allowance—it runs up to, I believe the testimony is, within 7,000 barrels of the total allowable of the field, isn't that true?

A. Under the present order, yes, sir.

Q. That is true?

A. Under the present order.

Q. Now, in considering a marginal allowance the present order not only gives a marginal allowance to the sub-marginal wells, but also to the wells that can produce more than that, up to those that can, that have a potential of 860 barrels per hour, isn't that true?

A. Yes, sir, wells up to 860 barrels an hour are considered marginal wells.

Q. That is the point I am making.

A. Is that your understanding?

Q. I thought that is what you said.

A. 860 barrels an hour and marginal wells?

Q. No, I say those are the wells that are included within this marginal allowance, and that comes up to within 7,000 barrels of the total allowable of the field?

A. Yes, but I wouldn't class those as marginal wells, though.

The Court:

You are splitting hairs about a term. He is talking about the effect of the order. Unless they make  
611. more than 860 barrels, as I understand, they get twenty barrels a day.

A. Yes, sir.

The Court:

And those wells that run higher get a proportion of what the weaker ones didn't make, and that is only 7,000 barrels?

A. I considered what you said, sub-marginal, as the margin and the other as the per well.

Q. Now, if you allocated the total allowable production of the field strictly on a potential basis and eliminated any marginal allowable you would not only reduce the sub-marginal wells below, say ten barrels a day, to take your figure, but you would also reduce a great many other wells that were not weak sisters, but that could produce considerably more than twenty barrels a day, you would reduce them below ten barrels a day on that system?

A. If ten barrels is the minimum of any well in the field, no, sir.

Q. No, Mr. Foran.

A. Pardon me. Do you mean a 200 barrel well might be given less than one of the sub-marginal wells? That was my understanding from your question.

Q. No, my question is this, Mr. Foran, if you applied strictly a potential method of allocation to the field as a whole, made no marginal allowance, would there not be a great number of wells that would get a daily allowance of less than ten barrels a day?

A. If no margin or minimum was set?

Q. Yes, sir.

612 A. Yes, sir.

Q. And those wells that would get less than ten barrels a day, would include not only weak sisters or submarginal wells, but include a great many wells that could produce if allowed to do so more than twenty barrels a day?

A. Yes, sir, that is true.

Q. Do you know how many wells under a straight potential method of allocation would be reduced below ten barrels a day?

A. There would be great numbers of them, wells making around 300 barrels an hour or 200 barrels an hour would fall under that list.

Q. And under your estimate of ten barrels a day, if that is the margin below which they can't be restricted without tending to cause waste, then those wells have to go out of production, would they not?

A. Not if you use ten. Right now you drop from twenty to fourteen, you dropped from twenty to fourteen in the last year and nothing went out of production, and I don't think fourteen is a critical setting, I don't think ten is unreasonable.

Q. I say if you assign an allowable to them below ten barrels a day.

A. High powered wells can be pinched below ten barrels and they will still produce if they are not pinched with water.

Q. What would you say is a marginal or minimum allowance below which you can't restrict wells?

A. I think some wells vary between five to ten barrels.

Q. All right let's say five barrels. If you applied a straight potential basis would there be a great  
613 number of wells that would be reduced below five barrels?

A. If you put no minimum on, yes, sir.

Q. And those wells that would be reduced below five barrels would include a great many wells that would actually produce a great deal more than twenty barrels a day?

A. That is true if no minimum was set.

Q. If you did that you would force a great many wells to be prematurely abandoned?

A. No, sir.

Q. If you didn't put a minimum on?

A. I believe in setting a minimum.

Q. You do believe in setting a minimum?

A. Yes, sir.

Q. The question is whether in your opinion do you think there is a—there is any grounds for debate as to whether that minimum should be five barrels or ten barrels or as much as fourteen barrels?

A. Yes, sir, I think that will take some additional thought.

Q. In other words, it is reasonable to set a marginal allowance, say as much as fourteen barrels a day?

A. I doubt if that would give equity.

Q. Do you think there is some reason for saying that is a reasonable marginal allowance?

A. I think it could be set below that without physical waste.

Q. Well, do you think engineers could reasonably differ with you?

A. If I could give my reason maybe it would clarify my answer.

Q. Could you answer my question?

A. I did, I said yes, I believe they can be set  
614 below there.

Q. My question was do you think engineers could reasonably differ about what that minimum could reasonably be?

A. I doubt if they would differ a great deal.

### Re-Direct Examination.

Questions by Mr. Moody:

Q. Mr. Foran, if you applied a straight potential that Mr. Hart is talking about there and some of these good wells, these strong wells, would be reduced below ten barrels a well by that potential?

A. Yes, sir.

Q. That would result from the fact, would it not, some fellow drilled a well on a little bitty tract of land?

A. Yes, sir.

Q. Or else drilled a small tract of land to a very great density?

A. Yes, sir.

Q. As it is being done now are there many or few people over in that field that by reason of having good wells on small tracts of land have produced more oil than ever was under that land and still have years to come on?

A. Yes, sir.

Q. Meanwhile the fellow next to him is not in that position?

A. Yes, sir.

Q. Now, in applying an acreage times potential factor in allocating this allowable could you allow a minimum of so much to the well or a minimum of so much to the lease and thereby reduce the disadvantage that people are now made to suffer as Mr. Rowan here is now suffering under the existing order?

A. Yes, sir, I believe it could be done.

615 Q. Now, then, here if a man has a tract of three acres in that field with three wells on it or four acres with three wells in it, and there are tracts drilled to that point of density over there, are there not?

A. Yes, sir.

Q. Now, do you know of any reason why you could not allow so much to that lease and why a man could not produce it all out of one well and close in the others? I don't mean plug it in, just close in the other wells and await some time until there might be a practical reason for operating those other wells?

A. Yes, sir.

Q. It wouldn't cause waste, would it?

A. No, sir.

Q. It wouldn't injure; be injurious to the well, would it?

A. No, sir.

The Court:

Mr. Hart got very close to a matter I was trying to get to. Is it your opinion that you have to take some notice of these smaller wells, you can't just weed them out?

A. Yes, sir, I believe you have to give them some consideration.

The Court:

Well, I am not talking about it from the standpoint of being nice to them, I am talking about it from a standpoint of whether the state will lose a natural resource if you don't do it. Have you got to take those wells into consideration in any fair scheme to develop that reservoir, or can you disregard them?

616 Mr. Moody:

Without preventing waste, is that what the Court has in mind?

The Court:

Yes, that is what I tried to make clear. I think the only grounds the state has to say to these people, "We are going to interfere with your business one way or another," is that this oil is a natural resource, "We will see you develop it in such a way you don't waste it. It doesn't make any difference to us who it belongs to, but you must not lose it and you must not waste it." Now, starting on that premise, the question that I had in mind—this is sort of thinking out loud—you have an order here that practically puts the field on a per well basis so that any well that can make twenty barrels can make it. If it can't make it it can make as much as it can, and here are a lot of wells that could make more if they were allowed to do so, but they are held back for these handicap people, except for this small amount of 7,000 barrels. Now, what I want to know, is at your opinion as an engineer, in drawing an order to prevent waste is it necessary to take these wells into consideration, these smaller wells that can't make so much, or could you eliminate it? Is the Commission justified in tying everybody else back because of the weak ones? Do I make my question clear to you?

A. Yes, sir. May I make an example, give an example?

The Court:

I want to get your idea. We are talking now, ventilating it among ourselves. You see, when you attack one rule the question comes up, what are you going to put in its place.

A. If I may make an explanation maybe my answer will be understood better. Take an example of a three or four acre tract that might have five or six wells on it. I would say you could shut down on a tract that small all the wells except one and never change it as to physical waste or recovery or anything else. To that extent you could totally disregard them, but to those isolated wells that may be locally dis-

connected from the pool and are weak wells, they would be in a different category.

The Court:

If they don't let them produce there will be oil which will never be brought to the surface?

A. I think so.

The Court:

If you admit that as a premise, how much do you have to let them produce to exist?

A. I think they can produce, exist, on ten barrels a day where they are not in the water area.

#### Re-Cross Examination.

Questions by Mr. Hart:

Q. Where the well is in the water area how much can they exist on?

A. Five barrels a day with a few exceptions. In exceptional cases maybe more. I couldn't say offhand, but in the majority of cases five barrels a day, and ten barrels a day in water area will take care of them.

Q. You mean the marginal will have to be higher or lower in the water area?

A. No, I think the general margin will take care of them.

Q. You say ten barrels for the east side. How much for the west side?

A. The same thing for the west side.

Q. The fact that they are producing water doesn't produce any additional cost?

618 A. Not with respect to physical waste alone.

Q. Premature abandonment of the well, which would lead to physical waste?

A. Premature abandonment is subject to water drive and on the east side I think the condition is entirely different.

Q. If you apply a straight potential method of allocation and have no minimum or marginal allowance then all wells which have a potential of 300 barrels per hour or less would receive an allowable of ten barrels per day or less? Under that method you would eliminate more than just the weak sisters?

A. I haven't figured it out, but it would not be unreasonable to arrive at something of that order. I have not figured it but I can conceive of that being the case.

Q. Then under that method of allocation, if you eliminated the marginal allowance, you not only eliminate these weak sisters but you eliminate wells that would produce 300 barrels per hour. What would that be per day?

A. 7,200 barrels per day, but I do not recommend eliminating a marginal. If I have given that impression I wish to correct it here. I would recommend a minimum.

The Court:

You think there should be a minimum of about ten barrels?

A. I wouldn't say arbitrarily ten barrels.

The Court:

Can they could make it?

A. Yes, sir.

The Court:

And then you take the difference between that and the top allowable and prorate it among the other wells on a basis of acreage or potential?

A. That may be one way, which I believe is more equitable than the present method.

The Court:

Your complaint against this order, then, is that it gives too much to the smaller wells?

A. Yes, sir, my complaint is that they make—

The Court:

I don't mean your complaint, I mean your criticism.

A. Yes, sir, they look at 800 barrels and one barrel with exactly the same eyes, and I can't reconcile myself to an order that makes no distinction between 80,000 per cent difference.

Q. If you took a ten barrel—of course, you have to take into consideration the Saturday and Sunday shut-down, under that the marginal allowance is reduced to about fourteen barrels?

A. That is true.

Mr. Moody:

That also hits one barrel and 860, they each produce only five days.

A. Yes, sir.

Q. It hits all, but if you adopted your figure of ten barrels a day and allowed them to produce seven days a week you treat those that produce one barrel a day and those 300 barrels a day the same?

A. That would be more equitable than the present.

### Re-Direct Examination.

Questions by Mr. Moody:

Q. Mr. Foran, insofar as these marginal wells on the east side are concerned that are producing less than twenty barrels a day, can you put them all in one class and say that to close these wells in would create waste as to every one of them? Isn't each one of them more or less an individual case?

A. A great many of them are, especially there in the southeastern edge of the field, in the southernmost part of the field.

Q. Now, then, the production of oil at the rate of five barrels a day and tremendous quantities of oil along with it, in order—

The Court:

What is that?

Q. I mean water, five barrels of oil and tremendous quantities of water together with that oil, doesn't the production of that water reduce the reservoir pressures and otherwise contribute to waste that is clear out of proportion to the five barrels of oil? Wouldn't it be better to leave the five barrels in the ground and trust that the water would wash it up-structure?

A. Yes, sir, because each barrel of water taken out of the reservoir and brought to the surface diminishes the pressure. Not quite so much as a barrel of oil, but about eighty per cent.

Q. When you consider the question whether or not these wells should be—these little weak sisters, as Mr. Hart calls them—most of them have been strong brothers in their day, haven't they? If you, when you consider these wells, you have to know more about the facts, don't you, than just that it is one of the group of wells, you have to know something about where that well is in relation to others? Some areas might be closed in without the state losing any of its natural resources and others of them maybe ought to be prolonged to see if they can do a little more?

A. Yes, sir, I believe that is right.

621 (Witness excused.)

Mr. Moody:

Gentlemen, I wonder if I could get this: I don't know whether it is in the record or not—I don't think it is—but that the wells over there in the East Texas field producing or having potentials of 200 barrels or more an hour are not pumping wells?

Mr. Hart:

I don't know whether it is true or not.

Mr. Moody:

Mr. Cottingham has figures on how many pumping wells there are over in that field.

The Court:

What is the materiality of it?

Mr. Moody:

Simply that the marginal well law applies only to pumping wells, and the statute says pumping wells shall not be reduced.

The Court:

Is it the contention of counsel on either side that if that marginal well law results in taking a disproportionate amount of the oil from the reservoir for those wells which come under that law and if you are going to put a ton allowable of say 500,000 barrels and these wells that fell under that law ran so high the other wells didn't get their part, would that law be valid?

Mr. Moody:

No, sir.

The Court:

Is the State contending they are bound by that law to accord to all these little wells this twenty barrels and accordingly because they had to give them that much that then they wouldn't give the other wells as much as they might be entitled to?

622

Mr. Hart:

I don't think they could do that.

The Court:

That is not your contention?

Mr. Hart:

No, sir. That situation doesn't arise in this case.

The Court:

There is some talk about that statute and I want to either get it in or out of the case.

Mr. Hart:

They are attacking it in this case, but I don't know that it is material.

Mr. Moody:

We are attacking it, your Honor, and saying as it is construed and applied it is invalid and now they say they don't construe it that way, but they say you produce your oil five days a week. They have two holidays and we divide what you produce by seven instead of five and we are producing fourteen—we are cutting you down to fourteen barrels a day, lower than the marginal well law, but you read their schedule and it says all wells up to 860 get twenty barrels. As I see it that is a subterfuge—and I don't use that word in an offensive sense at all—and in the practical effect of the order they are saying that all of these wells, because of the marginal well law, must have twenty barrels a well, even the little fellows, and thereby cut those down that have a lot more oil, to give these that don't have the capacity but to produce a small amount their oil. Now stripped of all its dressing and looking at the thing as it is, that is what you have, and that is our contention of the way this order construes and applies the marginal well law, and as so applied that law is void because it takes somebody's property without any sort of hearing or process and gives it to somebody else.

623 Mr. Hart:

Our contention is not that you can restrict the better wells to below the marginal wells. We do not have a situation here where better wells are restricted to below marginal wells.

The Court:

Then I suppose we had better have that evidence come into the case by agreement or proof.

Mr. Moody:

What I would like for them to do is furnish me—is have the Railroad Commission furnish me the number of pumping wells in the East Texas field, the number of such wells that make 20 barrels or less.

The Court:

If they have it and are willing to do it that is all right, but I wouldn't require them to get your evidence for you.

Mr. Moody:

No, sir, but they have reports that are made to them and I think we can agree on that. You have that information; haven't you the number of pumping wells in the East Texas field and the number of such wells that made 20 barrels or less per well?

Mr. Cottingham:

We can get that.

Mr. Moody:

Well, whatever the figures are. We will accept Mr. Cottingham's figures on that, if he will furnish us with that. With that matter in the record, the right to put it in later on, the plaintiff rests.

The Court:

Have you any rebuttal?

Mr. Hart:

No rebuttal, your Honor.

(Testimony closed.)

At the close of the testimony, the complainant and the respondents each in open Court moved for judgment on the pleadings and the evidence.

## 624 PROCEEDINGS ON PRE-TRIAL HEARING.

(Title Omitted.)

San Antonio, Texas, January 14, 1939.

(Style, number and jurisdiction omitted.)

625 Be It Remembered, that heretofore, to-wit, on the 14th day of January, A. D. 1939, at a pre-trial hearing in the above numbered and entitled cause, held in San Antonio, Texas, on said date, before the Hon. Robert J. McMillan, Judge, at which there were present:

Rice M. Tilley, Esq., Fort Worth, Texas,

Gov. Dan Moody, Austin, Texas,

Phillip Tocker, Esq., Fort Worth, Texas,

Appearing for Complainant.

Hon. James Hart, Asst. Attorney General, Austin, Texas,

Harry Pollard, Esq., Austin, Texas,

Durward Mahon, Esq.,

Appearing for Respondents.

Whereupon, the following proceedings were had, to-wit:

The Court:

Gentlemen, I was advised in my office that you gentlemen wanted a pre-trial hearing in this matter, and I set it down for this morning, and I will simply say to you

for your information that I know absolutely nothing about this case, or if I did know anything about it I have forgotten it. Maybe you have told me something about it on some prior occasions, but if so I have forgotten what it is. Who is the burden of procedure on here?

Mr. Tocker:

On the complainant.

The Court:

All right, now, what do you want?

Mr. Tilley:

Our complaint is rather lengthy, if the Court please, and of course they have answered, all except one  
 626 amended answer. By the way, we would like to have leave of Court to file an amendment whereby we substitute another paragraph for paragraph ten, which has been examined by counsel for the defendant. They haven't had an opportunity to deny the allegations contained in that paragraph yet, your Honor, but I assume that since they have denied the general allegations that we have made in connection with the subject matter in that paragraph, that they will more specifically deny that supplemental paragraph. It seems to me, unless it will take too much of the Court's time, and in order to familiarize the Court with the issues in the case and the lawsuit, that we might first agree on the documentary evidence, because we know pretty well what that is going to be. I think we will have no trouble over that. Then we can probably agree on the number of expert witnesses we will have and who they will be, so each side will be able to prepare its case accordingly, and then, of course, the issues in the case, if we can agree on those issues, then we might just go ahead and read the petition and in that way familiarize the Court with what the lawsuit is all about.

The Court:

No, I am not going to let you read the petition to me, that is too long.

Mr. Tilley:

I thought maybe you might not, and yet I thought you might want us to read it in order to clarify and trim down the facts, so the Court won't waste any time.

The Court:

It is the custom to state them, usually, a man can state a thing a whole lot quickly verbally than if he puts it on paper.

Mr. Tilley:

I will let Mr. Tocker then, he prepared the complaint, I will let him tell the Court substantially what is 627 in the complaint.

Mr. Tocker:

We complain principally of an order of the Railroad Commission restricting the allowable that complainant may daily produce from its five wells on a twenty-five acre lease located in the East Texas Field. We have described the East Texas Field and have sought to relate certain leases in the field generally, and our wells particularly. We have set up the fact that under the order of the Railroad Commission governing the ratable production from leases in the field generally, and our wells particularly, we are allowed to produce only 2.32 per cent of our hourly potential. We have alleged that the potential is a controlled potential and is taken, is measured by certain key wells in the field; that the potential is taken and contour lines then drawn from these key wells to indicate or measure the potential of the other wells in the field; that that method of proration, that basis of the taking of a potential is fiction, is not fact; that it does not

take into consideration the physical characteristics of the lease, this is particularly the thickness of the sand, position on the structure, the porosity and permeability of the sand, and that it results in a practically per well basis of proration; that we relate certain specific instances where the complainant in this case, with an average of one well to five acres, is allowed to produce no more than adjoining lease owner who has only one well to one acre; that by reason of this plan of proration it does not take into consideration the density of a lease or the acreage that we are losing oil to which we are entitled; that we are losing energy to which we are entitled; that

628 the wells to the east of our lease are receiving our

oil and draining it, and that they are receiving our reservoir energy, by reason of the present plan of proration, and that our wells will be dry long before we will have recovered the oil to which we are entitled. That what we believe we are entitled to is that proportion of the total daily allowable that the recoverable oil under our lease bears to the recoverable oil in the field; that the present proration plan does not give us that, and that for that reason it is void, constitutes a taking of our property without due process of law and denies to us equal protection of the law. We have set up in our petition that there can be ascertained and has been ascertained in the East Texas Oil Field accurate information as to sand thickness, properties of the reservoir sand and fluid contents, so as to estimate the quantity of oil and gas that underly respective leases, but that the Commission, notwithstanding it has this information available to it, has not undertaken to set up any plan of proration that takes these factors into consideration, and that these factors must be taken into consideration in order to give us an equal opportunity to recover that oil to which we are fairly entitled to, but that as a matter of fact, in the present plan the disparity between the poorest wells in the field and the best wells in the field is four barrels per day.

The Court:

I think I understand, gentlemen, the nature of your attack asks for a permanent injunction.

Mr. Tocker:

Yes, sir, we asked for a temporary injunction, but we have foregone that.

629 The Court:

Now, I think you gentlemen, in asking for this pre-trial hearing, you must have had some idea in mind as to something you could gain by having this. In other words, you want the other parties to agree to some things?

Mr. Tocker:

Yes, sir.

The Court:

And have you told them what they are?

Mr. Tocker:

No, we haven't told them what they are, but we have done this, we have taken both pleadings and analyzed them, and we have what facts and what allegations stand denied, and we would like the other side at this time to agree those fact allegations are those in dispute, and the fact issues in the case, the only fact issues in the case, and if there are any that stand denied they can agree on this morning we can eliminate those. In addition to that there is certain documentary evidence will have to be introduced that we want to agree on.

The Court:

In a pre-trial hearing, of course, the only way you get down to the benefit of it is to get down to cases, you can't talk generalities, you have to get down to saying, "We want to agree that this instrument is true, and agree we

can introduce this without proving it, and this one and this one," and in that way get down to specific things themselves.

Mr. Tocker:

We have such a list.

The Court:

Now, this rule provides for the holding of one of these hearings for the purpose of simplification of issues. Do you expect to amend anymore?

Mr. Hart:

If the Court please, we wish to file an amendment to our answer, of which a copy of that amendment has been given to counsel for complainant, and I understand they have no objection to our filing that amendment.

630 We have also just been furnished this morning with a supplemental complaint which makes new allegations which we haven't had time to study yet, and we would like an opportunity to.

The Court:

That will bring the pleadings to a close, will it?

Mr. Hart:

Yes, sir, I think so.

The Court:

Now, the first matter of simplification of issues in these equity cases, of course they are simplified a good deal by the way in which they are required to plead. They have to admit or deny or plead they are not in a position to do either. Haven't they done that?

Mr. Tocker:

Yes, they have.

The Court:

Now, in what respect have they denied your pleadings that you think they ought not to?

Mr. Tocker:

Well, there has been a denial of the position of the wells on our lease. What we would like for the respondents to do at this time is to agree that the following fact issues are the only issues in dispute as a result of the pleadings.

The Court:

Have you got them reduced to writing there?

Mr. Tocker:

Yes, sir.

The Court:

Suppose you let them look at them. (Paper passed to Mr. Haft.)

Mr. Tocker:

Since that was prepared, your Honor, they have filed an amended answer in which they have followed the new rules of Court and stated there were certain allegations they have no information on, as to the truth of it. Therefore they just stated they neither denied or admitted. Now, in addition to what is in that paper there will be issues they have now expressly denied, as a result of the pleading this morning.

Mr. Tilley:

That is rather lengthy, your Honor.

The Court:

Ordinarily they admit names of parties and residences, and admit you have a lease on certain property, and admit you have the wells you allege on the property, so we

can get to the questions involving opinion, say their improper method of proration, and then they won't admit, and then you have all these other matters admitted in their pleadings. They admit, I suppose, the promulgation of their order you attack?

Mr. Pollard:

Yes, sir.

The Court:

The rock you split on is whether the order is valid or not. Those allegations in your pleading of the unreasonableness and invalidity of the order you can't expect them to admit, and I don't suppose they will admit.

Mr. Tocker:

No, sir.

The Court:

Now, on the question of documents, do you have some documents in the crowd with you?

Mr. Tocker:

We have a list of documents, that they are familiar with, that we are asking them to admit can be introduced.

The Court:

What kind of documents would be in the case other than the order?

Mr. Tocker:

We want to introduce a proration schedule.

Mr. Hart:

That is all right.

The Court:

They will agree to that.

Mr. Tocker:

Then we want to introduce a map or maps showing ownership and number of locations on tracts in  
632 the East Texas Field.

Mr. Hart:

We don't know what maps they intend to introduce.

The Court:

Ordinarily those things are done so expeditiously, are so simple in these cases I don't see why we are wasting time about it. Now, ordinarily they tack a map on the board and some witness identifies it as being a true map.

Mr. Tocker:

What we contemplate doing is have the respondents agree, after we have exhibited these instruments to them, they will agree they can be introduced without proof as to their authenticity, and in that way avoid bringing a lot of witnesses we would have to bring otherwise to prove up the map.

Mr. Hart:

If the Court please, if we are reasonably assured the map is accurate—

The Court:

What kind of maps, to show wells and spacing?

Mr. Tocker:

Yes, sir.

The Court:

Surface maps?

Mr. Tocker:

Yes, sir, surface maps.

The Court:

Well, I expect the Railroad Commission has just as good maps as you have.

Mr. Tocker:

Well, sir, we hope they do.

Mr. Pollard:

If we can have a copy of the map they have in mind we would not require them to introduce a surveyor. All we would want would be a chance to check its authenticity.

Mr. Tilley:

May we ask them on the Hudnall map, that is pretty well known to the Commission, it is an ownership  
633 map gotten up by Mr. Hudnall.

The Court:

I think so.

Mr. Tilley:

Will you agree to that?

Mr. Hart:

Yes, we will agree to that.

The Court:

I have never seen any trouble yet about those maps or graphs, they have always put them in.

Mr. Tilley:

It will just save us a lot of time.

The Court:

What do you want to show, where the wells are located?

Mr. Tilley:

The density of the wells and the size of the tracts, and Hudnall's map has been generally accepted by most of the oil people as an ownership map.

The Court:

Not to indicate formation or anything like that, just a surface map?

Mr. Tilley:

Yes, sir.

Mr. Hart:

We will not object to the use of that map, but reserving the right to show if it is incorrect in any way, if it is.

Mr. Pollard:

We would likewise like to show that the maps, from the very nature of the relative size of the dots which denote wells, are sometimes wholly disproportionate, as to the size of the tract, but those are matters I think we can fully agree on between ourselves.

Mr. Tecker:

We would want an agreement at this time from the respondents, without the necessity of subpoenaing, the records of the Railroad Commission showing information as to sand thickness and fluid properties be made available in the trial of this case, in East Texas.

634

Mr. Hart:

We agree to that.

The Court:

Let the record show you agree to that.

Mr. Hart:

But I would like to have notice of what they want.

The Court:

I think that is reasonable.

Mr. Tilley:

And that uncertified copies can be used.

Mr. Hart:

We will agree to that.

Mr. Tocker:

We also want the records of the Railroad Commission of potential tests in the East Texas Field.

The Court:

These records are all public instruments?

Mr. Pollard:

Yes, sir. However, the volume of that would be rather large, if they wanted us to bring them all there.

The Court:

I think it is fair if you stipulate that in as much as those are all public documents you will give them access to any of them.

Mr. Pollard:

Yes, sir.

The Court:

And particularly if they designate what it is they want.

Mr. Pollard:

Yes, sir, we would be glad to furnish it.

The Court:

I don't know whether you are required to furnish them copies of them.

Mr. Pollard:

We will be glad to give them the information that they specify.

Mr. Hart:

If the Court please, some of the records, as I understand, are located in East Texas, and we will have to have several days' notice to get them.

Mr. Tocker:

All right.

Mr. Tilley:

We have not agreed that we can introduce these copies without their being certified. We can do that  
635 without their being certified?

Mr. Hart:

Yes, sir.

The Court:

Whatever you agree to, whatever is stipulated, ought to be written up.

Mr. Pollard:

That was all right, it was stipulated, he didn't understand.

Mr. Tocker:

May I suggest, your Honor, that we hard—they have had an opportunity to examine our list, we hand it to the Court reporter, and they agree to supply it, the records will be made available to us as indicated on there, subject to notice, and that such records as we intend to introduce will be admissible subject to examination by respondents, and then we won't have to go through all this; is that all right, Jim?

Mr. Hart:

Yes.

The Court:

That is agreeable, I understand. Now you are referring to the records of the Commission?

Mr. Tocker:

And the map we just mentioned, and all the rest on here are records of the Commission, yes, sir.

The Court:

They are certainly not going to object to the admissibility of any record on any ground other than it is not material to the case or something of that kind. If it is their own record they won't question the authenticity of it. It is simply a question of the mechanics of your getting it. They say they will make it available to you if you give them notice of what you want, and you can expect it, and I presume they will allow you to make copies of it.

Mr. Tocker:

Does that apply to the instruments on the list here?

636 The Court:

If it is a matter of which they have copies in large numbers they will probably give you copies.

Mr. Hart:

We will agree they can have available for examination, for making copies, any of the records of the Railroad Commission, or any maps, and we will not object to substitute copies on the ground that they are not certified. We don't understand, though, that we are under obligation to produce those records in Court, but that you will have copies made of such as you want and have them there at Court yourself; we won't have to produce them.

The Court:

I think that is right.

Mr. Tocker:

It may put a pretty heavy burden on us to make copies of all the records we want to introduce. I was just wondering if they wouldn't agree, if they are too voluminous to be copied, agree that they will be introduced and with the permission of the Court copies thereafter made.

Mr. Hart:

All right, we will make any reasonable agreement of that kind.

The Court:

What is the nature of the records, just orders of the Commission?

Mr. Tocker:

For example we want, as I have stated, all records of the Railroad Commission showing information of sand thickness in properties of the East Texas Field; records of the Railroad Commission on potentials based on key

wells in the East Texas Field; records of the Railroad Commission particularly with reference to the complaint in this case and the one of R. M. Woods, we want the records of the proceedings on the application of 637 R. M. Woods for permit to drill wells as an exception to Rule 37; we want the proration orders of the Railroad Commission for all other fields in Texas made available.

The Court:

Well, I imagine all those records exist in mimeograph, don't they?

Mr. Tocker:

Yes, sir.

The Court:

So they will probably give you some of those complimentary.

Mr. Pollard:

Our point was that he refers to all of the records of sand formations, and that would mean core records or well log records of over 25,000 wells in the East Texas Field alone.

The Court:

I think he would have to be more specific than that.

Mr. Pollard:

We will be glad to furnish whichever data it is they want.

(The list referred to by counsel for complainant is here-  
to attached at page 27.)

(Reporter's Note: Such list not attached to pre-trial transcript.)

Mr. Hart:

If the Court please, we also don't wish to admit some of this evidence he has spoken of is relevant.

The Court:

Not admitting its admissibility, simply its authenticity.

Mr. Tocker:

I think we are clear on that, your Honor. Now, the rules provide for agreement, if possible, on the limitation of the number of expert witnesses. I think we are prepared to state this morning how many expert witnesses we will have, and who they will be.

638 The Court:

I have found in a good many of these cases that the lawyers are reasonable about that; experts are not so plentiful or cheap that they will bring a great many of them. If you go to limiting it they say they want this expert on this phase of it and this one on another phase, and it is pretty hard to limit it. My experience is they rarely run over three or four.

Mr. Tocker:

I am wondering if at this time they know how many experts they plan to use.

Mr. Hart:

We don't know exactly what their witnesses are going to testify. We can't tell how many we will need. I don't see how we can bind ourselves to any particular number.

The Court:

"The Court will limit it if you contemplate, for instance, if you are going to put on eight or ten experts who are going to testify the same thing I will stop it. But I think you will find that will solve itself. How many do you think you are going to have?"

Mr. Tocker:

We are going to have three.

The Court:

It isn't a question of who has the most witnesses, it is a question of who has the best.

Mr. Tocker:

That is the premises we are willing to stand on.

The Court:

I will not limit the number of experts now, I will reserve the right to limit them on the trial, if they go to giving the same evidence.

Mr. Tocker:

These suggestions come from us in accordance with the new rules.

639 The Court:

Then we will just leave the matter of experts out, and won't make any limitations.

Mr. Tocker:

All right, sir.

Mr. Hart:

If the Court please, in connection with these records, I wonder if counsel would admit that true copies of the

records that are in the Comptroller's office may be introduced in evidence.

Mr. Tocker:

Yes, sir.

The Court:

All right, let the record show that.

Mr. Tilley:

One other thing in reference to expert testimony, the Court has tried a lot of these cases, and I know how many—you know how much rebuttal testimony there is. We may be able to stipulate who we contemplate using so we would save a lot of time preparing cross examination, so we won't have to delay in order to get testimony we will have to have in connection with it.

The Court:

I don't think the rule contemplates that they are going to tell you who their witnesses are going to be.

Mr. Pollard:

I don't think so either.

Mr. Tocker:

It is generally indicated we might do that.

The Court:

If they want to tell you who their witnesses will be, that is all right. Do you want to do that?

Mr. Pollard:

We don't know. I don't think we could do that, we just don't know.

Mr. Tocker:

What do we understand is the Court's pleasure with reference to the issues made by the pleadings? Does the Court feel that under the old equity rules that the probable issues are made as best they can be made and no agreement is necessary on those at this time?

640 The Court:

I don't think you need anything on it. We have tried dozens of these cases without trouble before under the old practice. The point is you come in and prove your lease and your wells, and then you give your opinions as to whether this order is wrong or not, and the case will gradually get down to that point.

Mr. Tocker:

Perhaps between now and the time of trial, with the copy that we have furnished the Attorney General, we can get together.

The Court:

You are not denying anything, are you, except their allegation that the order is unreasonable and void?

Mr. Hart:

That is substantially all. Of course, we have denied in detail their detailed allegation with reference to that issue.

Gov. Moody:

May I ask if you will make one or two agreements? First, the Railroad Commission has found that sand conditions in the East Texas Field with respect to permeability and porosity is substantially the same throughout the field?

Mr. Hart:

We can't agree to that.

The Court:

They refuse to agree on that.

Gov. Moody:

Will you agree that the Railroad Commission has found that the more wells drilled on the basis of one well to ten acres, the greater the ultimate recovery of oil?

Mr. Hart:

No, sir, we can't agree to that.

The Court:

They refuse to agree to that.

Gov. Moody:

Will you agree that the Railroad Commission has for a long time past and intends for the future, intends  
641 in the future to continue the method of prorating the East Texas Oil Field and allowing the proration, or allocating the proration between wells in the East Texas Field on the basis of potential alone?

Mr. Hart:

I think the orders speak for themselves in that respect, as to the basis on which the proration has been made, and we don't know what they are going to do in the future. We can't make any admission about that, except that the order is still in effect, and they intend to enforce it as long as it is in effect.

Gov. Moody:

Well, your Honor, my understanding is that the Railroad Commission adopted that policy some, oh, years, several years ago, Mr. Cottingham perhaps could tell, and it is repeated—of course, this is not evidence—it is repeated from month to month to month.

The Court:

I think those are matters that ought to stand by proof.

Gov. Moody:

The point I am making, your Honor, we can prove it by introducing copies of the orders, which come at the rate of twelve a year over a period of years.

The Court:

You are asking these counsel here to agree as to what their intention is in the future. Now, the Commission is an independent party. They are simply representatives of the Attorney General's office. They can't bind them here by admissions as to what they might do in the future. In fact, the law would contemplate that on the introduction of proof or from hearings that they might change their policy. The best evidence of their intention is the existence of continued enforcement of the present  
642 orders.

Gov. Moody:

But if the Commission declares its purpose to continue that policy.

The Court:

They said they won't agree to it.

Gov. Moody:

Let's see if they will agree to this, that the order of August 28, 1938, and orders entered since that date prorating the production of oil in the East Texas Field and allocating that field allowable among the wells in the field is based alone on the potential factor?

Mr. Hart:

If the Court please, I think it will be a whole lot simpler to introduce the orders and let them speak for them-

selves. That statement as to what they are based on is somewhat ambiguous.

The Court:

I think an agreement like that wouldn't be satisfactory, even to the Court. I would rather air out the orders and facts than to include some question like that in some fancy agreement. Anyway; regardless of how the Court feels about it, the parties don't want to agree to it.

Mr. Tocker:

There is one other point that we think they will agree on the testimony. At the time we filed the suit the order we complained of was the one dated August 28, 1938. Since that time there have been two or three orders entered continuing the present plan of proration, and so it won't be necessary for us to amend our petition to also complain of those orders.

Mr. Pollard:

In your amendment you allege it has been superseded in about the same percentage, as I understand.

Mr. Tocker:

That is correct, they get 2.32 per cent. We agree then that the orders that have been entered since the 643 order dated August 28, 1938, adopt the same basis of proration?

Mr. Pollard:

In a general way, yes, except as to minor variations.

Mr. Tocker:

And this complainant attacks that continuing system of proration without the necessity of amending and attacking each separate order.

Mr. Hart:

Yes.

Mr. Tocker:

That is agreed.

The Court:

Well, what will the record show with regard to that? Is it agreed that these orders that have been made since the filing of the suit are substantially the same as the one attacked in the original bill and it is unnecessary for the plaintiff to continue to amend to meet the orders as they are made.

Mr. Pollard:

Yes, sir, after the present time.

The Court:

All right, let the record show that. Is there anything further, gentlemen? Is there anything further from the plaintiff's side of the table?

Mr. Tilley:

Just a moment, if the Court please.

(Counsel for complainant and respondents then conferred briefly.)

Mr. Hart:

I am not sure this has been made plain, your Honor. I would like to have an agreement that both sides may introduce true copies of records of the Railroad Commission without the necessity of getting certified copies.

Mr. Tocker:

Yes, sir,

The Court:

Is there anything further from the defendant's side  
that you would like to bring up at this pre-trial  
644 hearing?

Mr. Pollard:

I want to say this; under No. 9 of the instruments he specifies is record of withdrawals from the R. M. Woods tract. I assume he refers to the Comptroller's records of withdrawals?

Mr. Tocker:

Yes, sir.

Mr. Pollard:

That is the amount of oil, taxes shown to have been paid by the Comptroller's records, and we are not supposed to furnish that to you, but to admit that when you have that record it will be admissible.

Mr. Tocker:

Yes, sir.

Mr. Tilley:

Now, if the Court please, there are some Schlumberger tests and logs and things like that, statistical matters and actual records by the various operators throughout the East Texas Field, and in the process of trying this case it would be necessary for expert witnesses to testify about conditions which the Commission, by virtue of its familiarity with those various logs and so forth—I think the testimony is probably admissible anyway, because it is generally accepted information, but will it be all right to admit that those logs are correct.

The Court:

Are the logs filed with the Commission?

Mr. Tilley:

No, sir, they are not filed with the Commission.

The Court:

Isn't the log of every well filed with the Commission?

Mr. Tilley:

They file a log, but not the Schlumberger generally.

645 . The Court:

I don't know about the Schlumberger, but the logs, I think the logs of the wells are filed with the Commission, and that certainly constitutes part of the Commission's records.

Gov. Moody:

Your Honor, what he is talking about are the electric log records or Schlumberger records, as they are called, of wells where the log is taken by the Schlumberger, and they have this long sheet of paper with the reports on it.

The Court:

You want a witness to testify from that, using that as a predicate on which to testify.

Gov. Moody:

What we are getting at is whether or not they will admit those logs as furnished by the Schlumberger people are correct without bringing the man that took them to prove up the record.

The Court:

I should think that if they produce an authentic Schlumberger test, that you have no doubt as to its being authentic, that you would not object to the witness testifying and using that as a basis on which to testify. I presume that it would have some character of certificate, some

evidence that it was a genuine, bona fide Schlumberger test.

Mr. Pollard:

It would have to depend, I think, in each instance upon the individual Schlumberger record they have. We couldn't agree as a broad proposition that each Schlumberger they bring forward, unknown at this time to them or to us, was accurately taken in every respect, and correctly and accurately reflects all the data.

Mr. Tilley:

We can limit that in this way, we will limit the agreement to an understanding that in the event you  
646 desire to contest any such log or schedule or whatever it is, that in the event you question that, why then that will not be admissible and the burden of proof will be on us, to support it by proper proof.

The Court:

Yes. As I understand it, you are going to introduce those matters as original evidence as a basis for some expert to testify from.

Mr. Tilley:

That is right.

The Court:

You can always ventilate those matters out on your expert. If he is any account as an expert, why you can certainly test him out on that Schlumberger test.

Mr. Tocker:

Your Honor, we would like for the agreement with reference to the copies of records, Railroad Commission records, to include the right to, where agreeable to respondents—

The Court:

Well, let's get one thing settled at a time. We haven't gotten past the Schlumberger matter yet. As I understand it, all they want you to agree, practically, is if they bring one of these tests, if you will agree it was actually made on the hole that they say it was. Now, as to the accuracy with which it was made or the effect of it, you don't agree to that.

Mr. Pollard:

We will do that, if they say they made the Schlumberger test on an individual well, we will agree to that, but if they want to use that as a factual basis for the expert opinion of some of their witnesses as to accuracy—

The Court:

You don't agree to the accuracy of it.

Mr. Pollard:

We would require them to prove it.

647 Gov. Moody:

The Schlumberger test is made, the result of it is there is a wavy line of points of high and low, and that is recorded on a record from which a photostatic copy is made. That shows it is made for the Schlumberger people, an electric log made on a certain well. Whether that device works well or doesn't work well, of course, is a matter we could not know. What we are asking them to do is when we present these records, these photostatic copies, which the gentlemen have seen, of the Schlumberger people, that they will agree it is a true copy of the Schlumberger log of that well, and as shown there that is what the Schlumberger test showed in that particular well, that is all we ask them to do, without requiring us to bring somebody up to prove that up.

The Court:

I think they wouldn't do that. You are willing to agree if they produce one of the Schlumberger tests and say it was made on such and such a well, you won't require them to bring the man that made the test, you will admit it, without admitting its accuracy or the way in which it was made?

Mr. Pollard:

Yes, sir.

The Court:

Is that right?

Mr. Hart:

If the Court please, if they don't have the man there that made it how can we find out whether it is accurate or not?

The Court:

Does anybody make those tests other than the Schlumberger people?

Mr. Tilley:

One other company, the Halliburton Oil Well Cementing Company. Let's agree if we produce what appears to be an official copy of a Schlumberger test, made by whoever it was made by, that it will be admissible, unless they want to question the accuracy of it, and in that event we will withdraw that particular one or introduce testimony to prove the accuracy of it.

Mr. Pollard:

That will shift to us the duty of disproving the accuracy of it, and we don't know whether it is accurate or not. We will admit when they produce that Schlumberger re-

cord, we will admit that it was taken, as to whether it was accurately taken or not we won't have any means to know.

The Court:

I think that is as far as I can ask them to go. The question of accuracy is one for the Court to decide, any light that may be thrown on that.

Mr. Tilley:

If it is just going to be admitted without any weight, why then I hardly understand how anything can be admitted that way.

The Court:

It is in evidence for whatever it is worth. Let the record show that the parties agree when they produce a properly authenticated Schlumberger test that it may be admitted in evidence as a test of the well that it purports to be a test of, the defendants not agreeing in any way to its accuracy or the facts shown by the test. Is there anything further?

Mr. Tocker:

Your Honor, we would like the agreement with reference to the copies of the Railroad Commission records, to extend that to the right to make a tabulation from such records, where practical, and correctly made. For example, you have the proration, montly proration orders from April, 1933, to the present date, based on hourly potential alone. Instead of introducing every one of those records we can just tabulate?

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The Court:

All right.

Mr. Tilley:

Right now, in reference to the tests that have been made to test sand and determine the water table, can we stipulate where that is made by a reliable company, such as the Humble Company, and we will let you say what a reliable company is, will that be admitted without bringing the particular person up or the particular official of the company up to establish the authenticity of that particular test?

Mr. Pollard:

No.

The Court:

You won't agree to that?

Mr. Hart:

Not in that form.

The Court:

Is there anything further, gentlemen, on either side? (No response.) All right, the Court will bring the hearing to a close.

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# EXHIBIT 1.

	Started	Completed
Todd 1-A.....	6-27-31	7-22-31
2-A.....	3- 7-32	3-19-32
3-A.....	6-25-33	7- 7-33
4-A.....	8-18-33	8-29-33
5-A.....	4-21-34	5- 3-34
6-A.....	5- 6-34	5-18-34
7-A.....	8- 8-34	8-25-34
Todd 1-B.....	11-14-31	11-27-31
2-B.....	10-18-31	11- 7-31

	Started	Completed
3-B.....	7-12-33	7-25-33
4-B.....	9- 3-33	9-18-33
5-B.....	5-21-34	6- 2-34

	Todd "A"	Todd "B"	Total
1931 .....	23,561.25	9,129.26	
1932 .....	34,360.67	40,112.83	
1933 .....	63,980.39	62,961.66	
1934 .....	85,228.11	71,140.36	
1935 .....	76,588.79	54,876.99	
1936 .....	62,188.33	44,078.65	
1937 .....	56,037.26	40,062.25	
1938 .....	45,994.00	32,891.91	
<hr/>			
Total Cumulative Production to 11-1-39.....	447,938.80	355,253.91	803,192.71
Number of Acres .....	28	25	53
Average per Acre Yield..	15,997.81	14,210.15	15,154.58
Total Woodbine thickness	90'— to 95'		
Total net sand thickness	60'— to 65'—		

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## EXHIBIT 2.

Barrels Now in Place.....	1,151,168
Daily Allowable Now .....	111.83
No. of Days to Recover All of the Oil With Present Daily Allowable .....	10.278
No. of Years (365 days each) .....	28.1
No. of Years (261 producing days) ..	39.3
Total Recoverable Oil in Field Now.	2,217,980,352
Daily Field Allowable Now .....	522,591

No. of Days to Recover All of the  
Oil With Present Daily Field

Allowable ..... 4,244=

No. of Years (365 producing days)..... 11.35

No. of Years (261 producing days)..... 16.26

Ultimate Recovery of the Field..... 3,522,710,352 100%

Production of Field to Date..... 1,304,730,000 37.04%

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2,217,980,352 Balance

Ultimate Recovery of Our Lease... 1,596,422 100%

Production to Date of Our Lease... 355,254 23.58%

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1,151,168 Balance

Average Woodbine Section field.... 42

Net Woodbine Sand Section..... 28.5

Woodbine Sand Section ..... 95. ft.

Net Sand Section ..... 65. ft.

80

885

4356 X .24% X .84% X .79% X .75% = 927.4 Bbls. per acre

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5.61

Percentage of Todd B reserves to total field .004276

Loss to 1-1-39 ..... 202,648 Bbls.

# EXHIBIT 3.

## Gladewater Townsite.

Company	Lease	Acreage	Wells
Allen, Hugo	Wood, R. M.	.30	1
Atlantic & Pacific	Harvey, E.	1.30	1-Abnd.
Bradley, W. W.	Fee	2.00	1
Bradley & Foshee	Godfrey, J. A.	4.75	2
Brown Eagle Oil Co.	T&P RR	14.50	5
Bumpas, Roy	Bumpas, R. E.	4.53	2-Abnd.
Burk Royalty Co.	Moore	1.5	1
Chief Prod. Co.	Todd, S. D. et al—Sec. 22.	2.00	1-Abnd.
Compton et al	Todd, S. D. et al—Sec. 24.	.75	1
Day & Company	Grimes, A. P.	.29	0
Day, L. & Armstrong	Jeter, L. A.	1.50	2
Dunham, C. G.	Walker, E. L.	1.26	2
	Foshee	2.00	2
	Jeter, J. T. "A"—Blk. 59	.75	1
	Jeter, J. T.—Blk. 58	1.50	2

Company	Lease	Acreage	Wells
Everett, L. J.	Fee	1.67	1
Everett & Phillips	Simmons Heirs	.72	1
Fields, Bert	Johnson, Ida	9.25	5
Fikes, L.	Turner, J. E.	.75	1
Florence, M. E.	Foshee, A. M.	2.50	2
	Rogers, F. E.	1.30	1
Gaskill, M. E.	Kay, Sam J.	1.86	1
	Kay, Sam J.	3.14	2
Gaskill, S. A.	Godfrey, J. A.	1.00	1
General American Oil Co.	Adams	.23	1
	Arnold	1.14	1-Abnd.
	Godfrey, J. A.	1.20	1
	Green	.25	1
	Stardivent, T. J.	2.00	3
	Turner	.15	1
	Wood, R. M.	2.00	1
Genro Drlg. Co.	Boyd, G.	1.30	1
			1-Abnd.
	Morgan, J. I.	.68	1
	Perry Estate	2.50	3

Gladewater Oil Co. ....	Johnson, Dellah	2.50	1
Gresham & Hunter .....	T&P RR "D" .....	2.00	1
	T&P RR "E" .....	2.00	1
	T&P RR "F" .....	2.00	1
	T&P RR "G" .....	10.00	6
Groneman .....	Thrasher, S. R. ....	.25	1
Hanbury, H. et al .....	Bray, T. L. ....	19.90	8
	Foshee, A. M. ....	2.50	2
	Gauge, J. H. "B" .....	.90	1
	Gauge, J. H. "G" .....	3.30	3
	Victory, J. H. ....	1.30	2
Hickman & Baird .....	T&P RR .....	2.00	1
Humble Oil & Refg. Co. ....	Fee .....	1.50	0
Iron Rock Oil Co. ....	Foshee, A. M.—Blk. 36 .....	1.30	2
	Foshee, A. M.—Blks. 44 & 45 .....	1.75	3
	Whittle, J. N. ....	.28	1
J. R. L. Oil Co. ....	M. E. Church .....	.66	1—Abnd.
	Stancil .....	.25	1—Abnd.
Johnson, T. A. ....	Victory, J. H. ....	2.50	2
Lange Cable Tool Drig. ....	Beamer, J. C. ....	.90	1
Laroe, Dan .....	DeMoss, J. E. ....	4.00	2
Lee, G. A. ....	Bell, Jim .....	2.00	2

Company	Lease	Acreage	Wells
Lee, T. W.	Hospital Lot	.50	1
Lee & Burnett	Lee & Jackson	.85	1
	Walker, E. L.	.25	1
	Wood	1.00	2
Lee & Hankamer	Lee, T. W.	.60	2
Lucey, J. F., Rec.	Johnson, O. R.	1.00	1
Manziel, Bobby	Compton	.28	1
	New Hope Baptist Church	.70	1
	Tenery, J. B.	2.00	2
	Victory, J. H.	.80	1-Abnd.
	Walker, E. L.—Blk. 54	.80	1
			1-Abnd.
Manziel, Joe et al	Walker, E. L.—Blk. 62	1.10	1
	Moore, C. H.	1.50	1
Marla Fay Oil Co.	Perry Estate	1.00	0
Martinwood	Everett, L. J.	1.50	1
Mecco Prod. Co.	Walker, N. E.	.84	1
	Hickman, O. L.—Blk. 71	2.00	1
	Hickman, O. L.—Blk. 75	1.30	0
	Hickman & Bair	1.50	2
	Moore, C. H.	15.00	5

T&P—Blk. 48	1.70	1
Blk. 51	1.06	1
Blk. 56	2.00	1
Blk. 67	2.00	1
Blk. 68	2.00	1
Blk. 70	2.00	1
Blk. 73	1.30	1
Blk. 74	1.30	2
Blk. 76	1.30	1
T&P RR "A"	2.50	1
T&P RR "B"	1.50	1
Fee	.12	1
T&P RR	.13	1
Minnesota & E. Texas	2.00	1
Gladewater Ind. Sch.—Blk. 20	.52	2-Abnd.
Blk. 21	.50	1
Ritchet, Geo.	1.43	2-Abnd.
Kay, Sam J.	1.25	1-Abnd.
Lee, T. W.	4.00	3-Abnd.
Woods, E. M.	5.00	4
Wood, R. M.	3.26	1-Abnd.
Pet. P. L. & S. Co.	.27	1
Phillips, B. F.		
Baptist Church		

Company	Lease	Acres	Wells
Brazzil		.29	1
City of Gladewater		2.60	2
			1-Abnd
Phillips, L.	Fee	2.80	2
	York, W. H.	.06	1
	Fee	.50	1
	Phillips, A. H. "B"	1.00	1
	Phillips, L.	.86	1
Phillips et al	Everett, L. J.	1.00	0
	York, W. H.	.75	1
Powell, L. W.	Jackson, J. C.	2.00	2
	Perry Estate	.20	1
	Stancil	.63	1
	Tennery, J. B.	2.00	2
	Victory, J. H.—Sec. 29	.90	1
	Victory—Sec. 45	.10	1
Powell & Irion	Johnson, D.	1.09	1
	Smith & Moody	1.50	2
Prater Oil Co.	Sampers	.12	1
Producers Pet. Co.	T&P RR—Blk. 12	1.00	3
	Blk. 10	.14	1

R. & G. Oil Co.	Wood, R. W.	.41	2
Rancho Oil Co.	Johnson, Ida	4.50	3
Repp Oil Co.	Wood, R. M.	1.25	1
Reynolds & Kimberlin	Perry Estate	.17	1
	Thompson	.57	1
Roosth & Genecov	Wood, R. M.	20.17	8
			2-Abnd.
Rousch, Benny	Rodden, M.	.13	1
Rudco O. & G. Co.	Hobbs, H.	2.00	1
	Rodden—Blk. 13	.43	1
	Rodden—Blk. 126	.50	1
Shelby Oil Co.	Norton, E. T.	2.00	1
Simmons, E. J.	Jackson, J. C.	.70	3
Stewart	Jackson, J. B.	1.50	1-Abnd.
Swain & Hamilton	Wood, R. W.	1.00	1
Swain-Holcomb	Bray	.68	1
	Glade Baptist Church	.68	1
	Wood, R. M.	.05	2
Torbert, J. S.	Green, J. A.	1.12	1
Traders Oil Co.	Richet, Geo.	.60	1
Trentman Oil Corp	Gladewater School	1.50	1

Company	Lease	Acreage	Wells
United East & West	Armstrong	.16	1
	Dunnaway	1.25	1
	Hailley	.28	1-Abnd.
	Rodden, L. A.	.66	1-Abnd.
	York, W. H.	2.00	1
	Fee	2.00	1-Abnd.
Walker, E. L.	Godfrey, J. A.	3.10	3
Wilcox Oil Co.	Rodden, Miles	4.13	3
Wilson, E. L.	Walker, E. L.	40.00	16
	Wood, R. M.	.36	1
		321.43	249—
			27 Abnd.

## Kilgore Townsite.

Company	Lease	Acreage	Wells
Adams, O. D.	Presby. Church	.75	5
Anding, A. F. et al	Hirsch	.08	1
	Martin, G.	.41	2

Apple, Jack	Johnson, J. M.	3.00	2
Atlantic Refg. Co.	Elder, Trip "A"	7.36	2
	Elder, Trip "B"	1.00	1
	Barton, P. E.		
	Barton, P. E. "A"	2.00	2
	Kilgore High School	8.35	4
Barnes, S. B. & H. M.	Willoughby	.47	2
Barnes & Ryan	Bean, I. S.	.54	2
Barnett Pet. Corp.	Dickson & Saxon	1.36	4
Brown, W. A.	Cheeseborough, W.	1.53	2
	Williams	.86	1
Callender, L. W.	Rowland, R. H.	11.89	9
Carroll, B. F. et al	City of Kilgore	.25	2
	Evans, F.	.30	2
	Hendrick, T. A.	.15	2
	Laird	.15	2
	Sharp	.15	2
	Whittington	.15	1
Carroll-Thompson	Jerry-Rider—Block No. 118	.19	3
	Jerry-Rider—Block No. 120	.06	1
	Foltz	.65	4
Carter, Tom	Compton	1.50	6
Cooper, O. R.	Shaw, Tom	1.00	1

Company	Lease	Acreage	Wells
Davenport	Hale, J. M.	3.21	1
Dearing & Son	Wallace, M. (Fee)	1.00	3
Dearing et al	Dickson, J. M.	3.03	3
Degener & Co., Inc.	Bell, S.	1.67	2
Delta Drilling Co.	Dunn	1.50	1
	Alexander, L.	3.75	3
Dodwell	Alexander, L.	3.50	4
Echo	Elder, John	2.20	2
Everett, C. A.	Barton, Mrs. B. M.	5.22	2
Everts Drilling Co.	Barton	1.00	4
	Laird, J. H.	10.35	9
Fleming, J. H.	Church Lot	30	3
Galvez Oil Co.	Alexander, H. C.	15.00	5
Gold Star Oil Co.	Butts, J. T.	.70	2
Grace Oil Company	Barton, M. G.	1.50	5
	Hughey, M. B.	1.50	5
	Hughey, S. P.	1.50	3
Gray, E. J.	Adams-Hale	.06	1
	Horton-Dickson	.90	1
Gray, E. J. & Johnson	Hale, M. E.	.06	1
Hall & Hall	Dickson	.75	5

Hammill & Smith	Archbault	.07	1
	Barton, P. E.	.76	2
	Butts, J. T. Fee	.17	2
	Butts, J. T. Heirs	.22	2
	Culp, Mary	.50	5
	Dumas	.07	1
Hammill & Smith Cont'd	Griffin, E. B.	.10	1 <sup>o</sup>
	Hughey, J. B.	1.00	4
	Kilgore National Bank	.10	1
	Knowles, J. A.	1.61	9
	Knowles, J. A. "A"	.26	1
Harcher Oil Company	Crim, W. N. "A"	.37	1
	Crim, W. N. "B"	.13	1
	Laird, R. H.	.35	2
	Lodge, K. O. P.	.25	1
Hastings Oil Co.	Robinson, Wm.	3.60	3
Hastings & Dodson	Boatwright	.68	3
	Hughey, B.	.30	3
Henry Oil Company	Laird, S. S. & Ben	5.56	12
Hindman, S. E.	Dickson, J. M.	.08	1
Humble Oil & Refg. Co.	Cumby, Annie	1.00	0
	I. & G. N. RR.	7.40	0

Company	Lease	Acreage	Wells
	Kilgore Cemetery	3.93	0
	Knowles, J. A.	93.80	28
	Thomas, Dura	59.05	21
Humphrey, T. D.	Spear, A.	24.35	24
James, T. L.	James	.30	1
	Lacy, Lawson	21.50	19
Jenkins, J. J.	Alexander, C.	2.11	2
	Crane, Mrs. Nettie	1.41	4
	Dickson, J. M.	1.94	2
	King-Crim	.75	4
Jess-Bob Oil Co.	Anderson, Mattie	4.07	3
Kemp, J. E.	King	.77	4
Kennedy, R. E.	Hale	.06	1
King, J. S.	Fee	1.00	1
	King-Cope	.17	1
	King Heirs	.80	1
L&M Oil Co.	Acuff Heirs	1.43	2
Lacy, Lawson	Osborne-Williams	.41	1
Lacy, Roger	Beal	1.40	1
	Douglass, J. M.	2.10	4
	Fee	8.25	6

Fee "B" .....	11.45	8
Johnson, J. M. ....	1.00	1
Lacy, L. ....	2.95	4
Pendegast-Beal .....	11.92	8
Muckelroy .....	.80	3
Rice, E. ....	1.00	2
Griffen, W. C. ....	1.72	3
Ostrom .....	1.42	1
Fee .....	.16	1
Colored Baptist Church .....	1.06	2
Baptist Church .....	.15	2
Baptist Church .....	.10	2
Bradley .....	.07	1
Dickson .....	.51	4
Dickson "A" .....	.07	1
Laird, Roy .....	.65	4
Griffin, L. A. ....	44.50	19
Rowland, R. H. ....	12.49	6
Anderson, W. H. ....	.98	1
Crim, L. N. ....	.60	2
Crim, W. R. "A" .....	1.60	4
Crim, W. R. "B" .....		
Laird, S. S. ....		
Lone-Star Oil Co. ....		
Lyons .....		
McGee, G. I. ....		
McMurray .....		
McVey, et al .....		
McVey, W. M. ....		
Magolia Pet. Co. ....		
Miller, P. L. ....		

Company	Lease	Acreage	Wells
Moore et al	Laird, Ben	1.30	4
	Laird Bros.	2.05	5
	Foltz, J. E.	.33	2
	Laird, Ben "B"	.50	2
Moss, Harry	Marshall, F.	30.00	16
			1-Abnd.
Murray, C. H.	Walton, Ida	4.67	3
	Odd Fellows Lodge	.29	1
	Walton, Ida	1.09	1
Nioco Oil Co.	Knowles, J. A.	7.03	9
Nix, R. H.	Barton, B. M. Est.	.17	1
Overton Refg. Co.	Butts, J. T.	.30	2
	Crane, J. M.	.39	2
	Crim, W. N.	.25	2
	Elder	.30	1
	Florence	.25	2
	I. & G. N. RR.	19.58	26
	Jerry	.05	1
	King Bros.	.77	2
	Prothro	2.00	2
	Young	.18	1

Pace Pet. Co.	Elder, T.	1.40	4
Pearce, J. W.	Bantuella	1.00	1
	Borders, J. V.	.40	2
	Shaw, Golden	1.00	1
	Shaw, T. "B"	1.00	2
Pearce, W. B.	Elder, H. T. & Son	.59	1
Pearson, V. J.	King	.14	1
Pearson & Kemp	Young	.22	<del>1</del>
Phillips Pet. Co.	I. & G. N. RR.	7.50	6
Pierce, W. B.	James, J. W.	.25	2
Pettit, C., Trust	King, J. S., Jr.	1.78	3
	Utzman, Gladys	1.84	3
Potter Bros. Prod. Co.	Alexander	3.00	3
	Bagwell	.15	1
	Bagwell-Laird	.20	2
	Barton Est., B. M.	3.53	4
	Colored Baptist	2.12	3
	Compton	.04	1
	Crane, J. M.	.39	2
	Crane, M.	.43	1
	Crim, L. D.	.39	3
	Dickson, J. N.	.10	1

Company	Lease	Acreage	Wells
Potter Bros. Cont'd	Dillard, H.	.15	1
	Dillingham	.15	1
	Dixie Mercantile Co.	.21	2
	Florence, J. T.	2.10	2
	Florence, J. T. "A"	3.00	3
	Gelber	.75	2
	Griffin, L. P.	1.99	4
Potter, Tom	Park, P. S. Est.	.87	1
	Sparks, Julia N.	2.01	2
	Bantuella	.13	1
	Daniels	.80	2
	James	.15	1
	Martin	.07	1
Producers Inv. Corp.	Butts, J. A.	6.58	9
	Crim, W. N.	3.80	4
	Rowland, R. H.	4.30	6
Rancho Oil Co.	Bean-Crim	1.60	7
	Rufus, M.	.50	1
Reynolds, Roy A.	Elder, J.	1.50	2
	Elder, Mrs. Z.	2.95	4
Rochelle	Waters, G.	.25	1

Roosth & Genecov .....	Barker .....	15	2
	Laird, J. ....	.15	2
	Obeithier .....	.15	1
	Young .....	.14	2
Ryan, A. Y. ....	Spear .....	.76	2
Schulman, H. ....	City of Kilgore, Blk. 175 .....	1.75	2
	City of Kilgore, Blk. 176 .....	1.75	1
Sharp, J. R. ....	Dorris, J. ....	3.56	3
	Duncan, E. ....	1.26	3
	King, A. ....	.88	4
	Martin-Dickson .....	1.72	3
Shell Pet. Corp. ....	Russell, Frank .....	.45	1
	I. G. N. (Frmly. Tom Potter) .....	3.50	2
Simmons, Jay .....	I. G. N. (Frmly. Southport) .....	2.00	3
	Beal, W. R. ....	.50	1
Smith, H. R., Inc. ....	Pyle, O. E. ....	.50	1
	Alexander, L. ....	3.50	3
	Peterson, D. M. ....	6.18	5
Southport Pet. Co. ....	Sanders .....	.66	1
Spear, A. B. ....	Crowder .....	.20	1
Stidham & Thrasher .....	Ector .....	1.00	2
	Russell, B. D. ....	1.56	3

Company	Lease	Acreage	Wells
Sugar-Maritsky-Merritt	Griffin, L. P.	2.14	4
Thompson	Rider	.03	1
Tide Water Assoc.	King, J. S.	80.00	20
Trapp, M. E.	King, J.	2.00	5
Trippet, R. G.	Johnson, J. M.	7.50	4
Turnbow, W. G.	Heard, W. C.	.20	1
	Knowles, J. A.	2.00	1
	Lacy, R.	.45	3
Wardlow, L. J.	King	.11	1
Weaver-Crim	Crim-Reynolds	1.60	4
Wells & Gann	Johnson, Georgia	4.71	5
Whaley, E., Oil Co.	Elder, H. T. & Son	.50	4
Wrather, J. O.	Hughey	.50	6
Wrightsmith Oil Co.	Griffin, W. C.	.70	2
	Harris	1.31	2
		721.33	697—
			1 Abnd.

## London Townsite.

Company	Lease	Acreage	Wells
Ambassador Oil Co. ....	Hamilton Heirs .....	.48	5
Butler-Calhoun & Boynton .....	London School .....	2.59	15
Cable Tool Drlg. Co. ....	Fee .....	.14	1
Champlin & Bass .....	Rhodes & Deskin .....	.05	2
Fisher, F. W., Rec. ....	Alford, J. R. ....	6.95	6
	Consolidated .....	1.07	7
	Wilson, G. W. "A" .....	3.50	10
	Wilson, J. B. "B" .....	.75	4
	Wooley, D. ....	.12	1
G. B. R. Oil Co. ....	Harmon, Mrs. L. ....	2.61	6
	Thrash, E. S. ....	3.05	10
	Town Heirs .....	.49	1
General American .....	Thompson, M. L. ....	6.36	16
Haddaway, R. ....	Methodist Church .....	1.25	6
	Presbyterian Church .....	.30	1
Hollingsworth Drlg. ....	Odd Fellow Lodge .....	.10	1
Jackson, J. ....	Maxwell Bolt Lot .....	.08	1
Johnson & Burnham .....	Whellis, J. W. ....	.20	0
Kline, M. A. ....	Maxwell .....	.59	1

Company	Lease	Acres	Wells
McCullough Oil Co.	Thompson, M. L.	1.00	2
Major Oil Co.	Craven, M. M.	.40	2
	Presbyterian Church	.20	1
Oklahoma-Texas Trust	Neal, R. T.	2.00	5
Overton-Refg. Co.	London School	.53	3
	Maxwell Bolt Lot	1.29	3
	Pool, L.	.26	2
	Rhodes & Deskin	.02	2
Regent Oil Co.	Harmon, L. "A"	2.00	3
	Harmon, L. "E"	3.60	10
Reynolds, Roy A.	Thrash, E. S.	1.00	3
Sanders & Murchison	Eaton, Geo. W.	.20	3
Stanolind O. & G. Co.	Thompson, M. L.	.69	1
Tex-Jersey Oil Co.	Eaton, G. W.	1.18	5
	Keeling, W. P. "A"	5.48	7
	Keeling, W. P. "B"	.30	5
Thompson, Will	Thompson	.08	1
Walters & Sanford	Baptist Church	.50	2
		51.41	154

## Overton Townsite.

Carta Blanca .....	De Guerin .....	1.00	1-Abnd.
	Key-Moore .....	1.00	1-Abnd.
	Minor .....	2.50	1-Abnd.
	Moore .....	1.00	1-Prod.
	Priddy .....	2.50	1-Abnd.
	Teague .....	2.50	1-Abnd.
	Lawn .....	1.00	1-Abnd.
Cox .....	Flory .....	.60	1-Prod.
D. E. F. Oil Co. ....	Barton .....	1.00	1-Prod.
P. & S. Oil Co. ....	Barton .....	3.00	1-Abnd.
Trentman .....			
		16.10	10—
			7 Abnd.

## Gladewater Townsite

Company	Lease	Acreage	Wells
Allen, Hugh .....	Wood, R. M. ....	.30	1
Atlantic & Pacific .....	Harvey, E. ....	1.30	1-Abnd.
Bradley, W. W. ....	Fee .....	2.00	1.
Bradley & Foshee .....	Godfrey, J. A. ....	4.75	2

Company	Lease	Acreeage	Wells
Brown Eagle Oil Co.	T&P RR.	14.50	5
Bumpass Roy	Bumpass, R. E.	4.53	2-Abnd.
Burk Royalty Co.	Moore	1.5	1
Chief Prod. Co.	Todd, S. D. et al—Sec. 22	2.00	1
Compton et al	Todd, S. D. et al—Sec. 24	.75	1
Day & Company	Grimes, A. P.	.29	0
Day, L. & Armstrong	Jeter, L. A.	1.50	2
Dunham, C. G.	Walker, E. L.	1.26	2
	Foshee	2.00	2
	Jeter, J. T. "A"—Blk. 59	.75	1
	Jeter, J. T.—Blk. 58	1.50	2
Everett, L. J.	Fée	1.67	1
Everett & Phillips	Simmons Heirs	.72	1
Fields, Bert	Johnson, Ida	9.25	5
Fikes, L.	Turner, J. E.	.75	1
Florence, M. E.	Foshee, A. M.	2.50	2
Gaskill, M. E.	Rogers, F. E.	1.30	1
	Kay, Sam J.	1.86	1
	Kay, Sam J.	3.11	2

Gaskill, S. A. ....	Godfrey, J. A. ....	1.00	1
General American Oil Co. ....	Adams .....	.23	1
			1-Abnd.
	Arnold .....	1.14	1
	Godfrey, J. A. ....	1.20	1
	Green .....	.25	1
	Stardivent, T. J. ....	2.00	3
	Turner .....	.15	1
	Wood, R. M. ....	2.00	1
Genro Drlg. Co. ....	Boyd, G. ....	1.30	1
			1-Abnd.
	Morgan, J. I. ....	.68	1
	Perry Estate .....	2.50	3
Gladewater Oil Co. ....	Johnson, Dellah .....	2.50	1
Gresham & Hunter .....	T&P RR "D" .....	2.00	1
	T&P RR "E" .....	2.00	1
	T&P RR "F" .....	2.00	1
	T&P RR "G" .....	10.00	6
Gropeman .....	Thrasher, S. R. ....	.25	1
Hanbury, H. et al .....	Bray, T. L. ....	19.90	8
	Foshee, A. M. ....	2.50	2
	Gauge, J. H. "B" .....	.90	1

Company	Lease	Acreage	Wells
	Gauge, J. H. "G"	3.30	3
	Victory, J. H.	1.30	2
	T&P RR	2.00	1
Hickman & Baird	Fee	1.50	0
Humble-Oil & Refg. Co.	Foshee, A. M.—Blk. 36	1.30	2
Iron Rock Oil Co.	Foshee, A. M.—Blks. 44 & 45	1.75	3
	Whittle, J. N.	.28	1
J. R. L. Oil Co.	M. E. Church	.66	1-Abnd.
	Stancil	.25	1-Abnd.
Johnson, T. A.	Victory, J. H.	2.50	2
Lange Cable Tool Drlg.	Beamer, J. C.	.90	1
Laroe, Dan	DeMoss, J. E.	4.00	2
Lee, C. A.	Bell, Jim	2.00	2
Lee, T. W.	Hospital Lot	.50	1
	Lee & Jackson	.85	1
Lee & Burnett	Walker, E. L.	.25	1
	Wood	1.00	2
Lee & Hankamer	Lee, T. W.	.60	2
Lucey, J. F., Rec.	Johnson, O. R.	1.00	1
Manziel, Bobby	Compton	.28	1
	New Hope Baptist Church	.70	1

Tenery, J. B.	2.00	2	2
Victory, J. H.	.80	1-Abnd.	1-Abnd.
Walker, E. L.—Blk. 54	.80	1	1
Walker, E. L.—Blk. 62	1.10	1-Abnd.	1-Abnd.
Manziel, Joe et al	1.50	1	1
Moore, C. H.	1.00	0	0
Perry Estate	1.50	1	1
Everett, L. J.	.84	1	1
Walker, N. E.	2.00	1	1
Hickman, O. L.—Blk. 71	1.30	0	0
Hickman, O. L.—Blk. 75	1.50	2	2
Hickman & Baird	15.00	5	5
Moore, C. H.	1.70	1	1
T & P—Blk. 48	1.06	1	1
Blk. 51	2.00	1	1
Blk. 66	2.00	1	1
Blk. 67	2.00	1	1
Blk. 68	2.00	1	1
Blk. 70	2.00	1	1
Blk. 73	1.30	1	1
Blk. 74	1.30	2	2
Blk. 76	1.30	1	1
Mecco Prod. Co. Con'd.			
Marla Fay Oil Co.			
Martinwood			
Mecco Prod. Co.			
Mecco Prod. Co. Con'd.			

Company	Lease	Acreage	Wells
Midfield	T & P. RR. "A"	2.50	1
	T & P. RR. "B"	1.50	1
	Fee	.12	1
	T & P. RR.	.13	1
Minnesota & E. Texas	Gladewater Ind. Scho.—		
	Blk. 20	2.00	1
	Blk. 21	.52	2-Abnd.
Nathan Pipe & Supply Co.	Ritchet, Geo.	.50	1
	Kay, Sam J.	1.43	2-Abnd.
	Lee, T. W.	1.25	1-Abnd.
	Woods, E. M.	4.00	3-Abnd.
P. & W. Oil Co.	Wood, R. M.	5.00	4
Pet. P. L. & S. Co.	Kay, Sam J.	3.26	1-Abnd.
Phillips, B. F.	Baptist Church	.27	1
	Brazzil	.29	1
	City of Gladewater	2.60	2
	Fee	2.80	1-Abnd.
	York, W. H.	.06	2
	Fee	.50	1
Phillips, L.	Phillips, A. H. "B"	1.00	1

Phillips et al	Phillips, L.	.86	1
	Everett, L. J.	1.00	0
	York, W. H.	.75	.1
Powell, L. W.	Jackson, J. C.	2.00	2
	Perry Estate	.20	1
	Stancil	.63	1
	Tennery, J. B.	2.00	2
	Victory, J. H.—Sec. 29	.90	1
	Victory—Sec. 45	.10	1
Powell & Irion	Johnson, D.	1.09	1
	Smith & Moody	1.50	2
Prater Oil Co.	Sampere	.12	1
Producers Pet. Co.	T. & P. RR.—Blk. 12	1.00	3
	Blk. 10	.14	1
R. & G. Oil Co.	Wood, R. W.	.41	2
Rancho Oil Co.	Johnson, Ida	4.50	3
Repp Oil Co.	Wood, R. M.	1.25	1
Reynolds & Kimberlin	Perry Estate	.17	1
	Thompson	.57	1
Roosth & Genecov	Wood, R. M.	20.17	8
Rousch, Benny	Rodden, M.	.13	2-Abnd.
			1

Company	Lease	Acreage	Wells
Rudco O. & G. Co.	Hobbs, H.	2.00	1
	Rodden—Blk. 13	.43	1
	Rodden—Blk. 126	.50	1
Shelby Oil Co.	Norton, E. T.	2.00	1
Simmons, E. J.	Jackson, J. C.	.70	3
Stewart	Jackson, J. B.	1.50	1—Abnd.
Swain & Hamilton	Wood, R. W.	1.00	1
Swain-Holcomb	Bray	.68	1
	Glade Baptist Church	.68	1
	Wood, R. M.	.05	2
Torbert, J. S.	Green, J. A.	1.12	1
Traders Oil Co.	Richet, Geo.	.60	1
Trentman Oil Corp.	Gladewater School	1.50	1
United East & West	Armstrong	.16	1
	Dunnaway	1.25	1
			1—Abnd.
	Hailley	.28	1—Abnd.
	Rodden, L. A.	.66	1
	York, W. H.	2.00	1—Abnd.
Walker, E. L.	Fee	2.00	1—Abnd.
Wilcox Oil Co.	Godfrey, J. A.	3.10	3

Wilson, E. L. ....	Rodden, Miles	4.13	3
Walker, E. L. ....		40.00	16
Wood, R. M. ....		.36	1
		<hr/>	<hr/>
		321.43	249
			27 Abnd.

## Kilgore Townsite.

Company	Lease	Acreage	Wells
Adams, O. D. ....	Presby. Church	.75	5
Anding, A. F. et al	Hirsch	.08	1
Apple, Jack	Martin, G.	.41	2
Atlantic Refg. Co.	Johnson, J. M.	3.00	2
	Elder, Trip "A"	7.36	2
	Elder, Trip "B"	1.00	1
	Barton, P. E.		
	Barton, P. E. "A"	2.00	2
Barnes, S. B. & H. M.	Kilgore High School	8.35	4
Barnes & Ryan	Willoughby	.47	2
Barnett Pet. Corp.	Bean, I. S.	.54	2
	Dickson & Saxon	1.36	4

Company	Lease	Acreage	Wells
Brown, W. A. ....	Cheeseborough, W. ....	1.53	2
Callender, L. W. ....	Williams .....	.86	1
Carroll, B. F. et al .....	Rowland, R. H. ....	11.89	3
	City of Kilgore .....	.25	2
	Evans, F. ....	.30	2
	Hendrick, T. A. ....	.15	2
	Laird .....	.15	2
	Sharp .....	.15	2
	Whittington .....	.15	1
Carroll-Thompson .....	Jerry-Rider—Block No. 118 .....	.19	3
	Jerry-Rider—Block No. 120 .....	.06	1
Carter, Tom .....	Foltz .....	.65	4
Cooper, O. R. ....	Compton .....	1.50	6
	Shaw, Tom .....	1.00	1
Davenport, J. M. ....	Hale, J. M. ....	3.21	1
Dearing & Son .....	Wallace, M. (Fee) .....	1.00	3
Dearing et al .....	Dickson, J. M. ....	3.03	3
Degener & Co., Inc. ....	Beil, S. ....	1.67	2
Delta Drilling Co. ....	Dunn .....	1.50	1
	Alexander, L. ....	3.75	3
Dodwell .....	Alexander, L. ....	3.50	4

Echo .....	Elder, John .....	2.20	2
Everett, C. A. ....	Barton, Mrs. B. M. ....	5.22	2
Everts Drilling Co. ....	Barton .....	1.00	4
	Laird, J. H. ....	10.35	9
Fleming, J. H. ....	Church Lot .....	.30	3
Galvez Oil Co. ....	Alexander, H. C. ....	15.00	5
Gold Star Oil Co. ....	Butts, J. T. ....	.70	2
Grace Oil Company .....	Barton, M. G. ....	1.50	5
	Hughey, M. B. ....	1.50	5
	Hughey, S. P. ....	1.50	3
Gray, E. J. ....	Adams-Hale .....	.06	1
	Horton-Dickson .....	.90	1
Gray, E. J. & Johnson .....	Hale, M. E. ....	.06	1
Hall & Hall .....	Dickson .....	.75	5
Hammill & Smith .....	Archbault .....	.07	1
	Barton, P. E. ....	.76	2
	Butts, J. T. Fee .....	.17	2
	Butts, J. T. Heirs .....	.22	2
	Culp, Mary .....	.50	5
	Dumas .....	.07	1
	Griffin, E. B. ....	.10	1

2

Company	Lease	Acreage	Wells
Hammill & Smith Cont'd.			
	Hughey, J. B.	1.00	4
	Kilgore National Bank	.40	1
	Knowles, J. A.	1.61	9
	Knowles, J. A. "A"	.26	1
	Crim, W. N. "A"	.37	1
	Crim, W. N. "B"	.13	1
	Laird, R. H.	.35	2
	Lodge, K. O. P.	.25	1
Hastings Oil Co.	Robinson, Wm.	3.60	3
Hastings & Dodson	Boatwright	.68	3
	Hughey, B.	.30	3
Henry Oil Company	Laird, S. S. & Ben	5.56	12
Hindman, S. E.	Dickson, J. M.	.08	1
Humble Oil & Refg. Co.	Cumby, Annie	1.00	0
	I. & G. N. RR.	7.40	0
	Kilgore Cemetery	3.93	0
	Knowles, J. A.	93.80	28
	Thomas, Dura	59.05	21
Humphrey, T. D.	Spear, A.	24.35	24
James, T. L.	James	.30	1
	Lacy, Lawson	21.50	19

Jenkins, J. J.	Alexander, C.	2.11	2
	Crane, Mrs. Nettie	1.41	4
	Dickson, J. M.	1.94	2
	King-Crim	.75	4
Jess-Bob Oil Co.	Anderson, Mattie	4.07	3
Kemp, J. E.	King	.77	4
Kennedy, R. E.	Hale	.06	1
King, J. S.	Fee	1.00	1
	King-Cope	.17	1
	King Heirs	.80	1
L. & M. Oil Co.	Acuff Heirs	1.43	2
Lacy, Lawson	Osborne-Williams	.41	1
Lacy, Roger	Beal	1.40	1
	Douglass, J. M.	2.10	4
	Fee	8.25	6
	Fee "B"	11.45	8
	Johnson, J. M.	1.00	1
	Lacy, L.	2.95	4
	Pendegast-Beal	11.92	8
	Muckelroy	.80	3
Laird, S. S.	Rice, E.	1.00	2
Lone Star Oil Co.	Griffen, W. C.	1.72	3

Company	Lease	Acreage	Wells
Lyons	Ostrom	1.42	1
McGee, G. I.	Fee	.16	1
McMurray	Colored Baptist Church	1.06	2
McVey, et al	Baptist Church	.15	2
McVey, W. M.	Baptist Church	.10	2
McVey, M. W.	Bradley	.07	1
	Dickson	.51	4
	Dickson "A"	.07	1
	Laird, Roy	.65	4
Magnolia Pet. Co.	Griffin, L. A.	44.50	19
	Rowland, R. H.	12.49	6
Miller, P. L.	Anderson, W. H.	.98	1
	Crim, L. N.	.60	2
	Crim, W. R. "A"	1.60	4
	Crim, W. R. "B"		
	Laird, Ben		
	Laird Bros.	2.05	5
Moore et al	Foltz, J. E.	.33	2
	Laird, Ben "B"	.50	2
Moss, Harry	Marshall, F.	30.00	16
			1-Abnd.

Murray, C. H.	Walton, Ida	4.67	3
	Odd Fellows Lodge	.29	1
	Walton, Ida	1.09	1
Nioco Oil Co.	Knowles, J. A.	7.03	9
Nix, R. H.	Barton, B. M. Est.	.17	1
Overton Refg. Co.	Butts, J. T.	.30	2
	Crane, J. M.	.39	2
	Crim, W. N.	.25	2
	Elder	.30	1
	Florence	.25	2
	I. & G. N. RR.	19.58	26
	Jerry	.05	1
	King Bros.	.77	2
	Prothro	2.00	2
	Young	.18	1
Pace Pet Co.	Elder, T.	1.40	4
Pearce, J. W.	Bantuella	1.00	1
	Borders, J. V.	.40	2
	Shaw, Golden	1.00	1
	Shaw, T. "B"	1.00	2
Pearce, W. B.	Elder, H. T. & Son	.59	1
Pearson, V. J.	King	.14	1

Company	Lease	Acreage	Wells
Pearson & Kemp	Young	.22	1
Phillips Pet. Co.	I & G. N. RR.	7.50	6
Pierce, W. B.	James, J. W.	.25	2
Pettit, C., Trust	King, J. S., Jr.	1.78	3
Potter Bros. Prod. Co.	Utzman, Gladys	1.84	3
	Alexander	3.00	3
	Bagwell	.15	1
	Bagwell-Laird	.20	2
	Barton Est., B. M.	3.53	4
	Colored Baptist	2.12	3
	Compton	.04	1
	Crane, J. M.	.39	2
	Crane, M.	.43	1
	Crim, L. D.	.39	3
	Dickson, J. N.	.10	1
	Dillard, H.	.15	1
	Dillingham	.15	1
	Dixie Mercantile Co.	.21	2
	Florence, J. T.	2.10	2
	Florence, J. T. "A"	3.00	3
	Gelber	.75	2

Potter Bros. Prod. Co. Cont'd.	Griffin, L. R.	1.99	4
	Park, P. S. Est.	.87	1
Potter, Tom	Sparks, Julia N.	2.01	2
	Bantuella	.13	1
	Daniels	.80	2
	James	.15	1
	Martin	.07	1
Producers Inv. Corp.	Butts, J. A.	6.58	9
	Crim, W. N.	3.80	4
	Rowland, R. H.	4.30	6
Rancho Oil Co.	Bean-Crim	1.60	7
	Rufus, M.	.50	1
Reynolds, Roy A.	Elder, J.	1.50	2
	Elder, Mrs. Z.	2.95	4
Rochelle	Waters, G.	.25	1
Roosth & Genecov	Barker	.15	2
	Laird, J.	.15	2
	Obeithier	.15	1
	Young	.14	2
Ryan, A. Y.	Spear	.76	2
Schulman, H.	City of Kilgore, Blk. 175	1.75	2
	City of Kilgore, Blk. 176	1.75	1

Company	Lease	Acreage	Wells
Sharp, J. R.	Dorris, J.	3.56	3
	Duncan, E.	1.26	3
	King, A.	.88	4
	Martin-Dickson	1.72	3
	Russell, Frank	.45	1
Shell Pet. Corp.	I. G. N. (Frmly. Tom Potter)	3.50	2
	I. G. N. (Frmly. Southport)	2.00	3
Simmons, Jay	Beal, W. R.	.50	1
	Pyle, O. E.	.50	1
Smith, H. R., Inc.	Alexander, J.	3.50	3
	Peterson, D. M.	6.18	5
	Sanders	.66	1
Southport Pet. Co.	Crowder	.20	1
Spear, A. B.	Ector	1.00	2
Stidham & Thrasher	Russell, B. D.	1.56	3
Sugar-Maritzky-Merritt	Griffin, L. P.	2.14	4
Thompson	Rider	.03	1
Tide Water Assoc.	King, J. S.	80.00	20
Trapp, M. E.	King, J.	2.00	5
Trippet, R. G.	Johnson, J. M.	7.50	4
Turnbow, W. C.	Heard, W. C.	.20	1

Wardlow, L. J.	Knowles, J. A.	2.00	1
Weaver-Crim	Lacy, R.	.45	3
Wells & Gann	King	.11	1
Whaley, E., Oil Co.	Crim-Reynolds	1.60	4
Wrather, J. O.	Johnson, Georgia	4.71	5
Wrightsmith Oil Co.	Elder, H. T. & Son	.50	4
	Hughey	.50	6
	Griffin, W. C.	.70	2
	Harris	1.31	2
		<hr/> 721.33	<hr/> 697—
			1 Abnd.

## London Townsite.

Company	Lease	Acreage	Wells
Ambassador Oil Co.	Hamilton Heirs	.48	5
Butler-Calhoun & Boynton	London School	2.59	15
Cable Tool Drlg. Co.	Fee	.14	1
Champlin & Bass	Rhodes & Deskin	.05	2
Fisher, F. W., Rec.	Alford, J. B.	6.95	6
	Consolidated	1.07	7
	Wilson, G. W. "A"	3.50	10
	Wilson, J. B. "B"	.75	4
	Wooley, D.	.12	1

Company	Lease	Acreage	Wells
G. B. R. Oil Co.	Harmon, Mrs. L.	2.61	6
	Thrash, E. S.	3.05	10
General American	Towns Heirs	.49	1
Haddaway, R.	Thompson, M. L.	6.36	16
	Methodist Church	1.25	6
Hollingsworth Drlg.	Presbyterian Church	.30	1
Jackson, J.	Odd Fellow Lodge	.10	1
Johnson & Burnham	Maxwell Bolt Lot	.08	1
Kline, M. A.	Wheelis, J. W.	.20	0
McCullough Oil Co.	Maxwell	.59	1
Major Oil Co.	Thompson, M. L.	1.00	2
	Craven, M. M.	.40	2
Oklahoma-Texas Trust	Presbyterian Church	.20	1
Overton Refg. Co.	Neal, R. T.	2.00	5
	London School	.53	3
	Maxwell Bolt Lot	1.29	3
	Pool, L.	.26	2
Regent Oil Co.	Rhodes & Deskin	.02	2
	Harmon, L. "A"	2.00	3
	Harmon, L. "B"	3.60	10
Reynolds, Roy A.	Thrash, E. S.	1.00	3
Sanders & Murchison	Eaton, Geo. W.	.20	3

Stanolind O. & G. Co. ....	Thompson, M. L. ....	.69	1
Tex-Jersey Oil Co. ....	Eaton, G. W. ....	1.18	5
	Keeling, W. P. "A" ....	5.48	7
	Keeling, W. P. "B" ....	.30	5
Thompson, Will .....	Thompson .....	.08	1
Walters & Sanford .....	Baptist Church .....	.50	2
		<hr/>	
		51.41	154

## Overton Townsite.

Company		Lease		Acreage Wells	
Carta Blanca .....	De Guerin .....	1.00	1-Abnd.	1.00	1-Abnd.
	Key-Moore .....	1.00	1-Abnd.	1.00	1-Abnd.
	Minor .....	2.50	1-Abnd.	2.50	1-Abnd.
	Moore .....	1.00	1-Prod.	1.00	1-Prod.
	Priddy .....	2.50	1-Abnd.	2.50	1-Abnd.
	Teague .....	2.50	1-Abnd.	2.50	1-Abnd.
Cox .....	Lawn .....	1.00	1-Abnd.	1.00	1-Abnd.
D. E. F. Oil Co. ....	Flory .....	.60	1-Prod.	.60	1-Prod.
P. & S. Oil Co. ....	Barton .....	1.00	1-Prod.	1.00	1-Prod.
Trentmar .....	Barton .....	3.00	1-Abnd.	3.00	1-Abnd.
		<hr/>		<hr/>	
		16.10	10—	16.10	10—
					7 Abnd.

## EXHIBIT No. 4.

Railroad Commission of Texas.

Oil and Gas Division.

Case No. .... Rule 37.

In Re: Application of Rowan & Nichols for Special Permit to Drill Wells Nos. 6 to 25 Inclusive on the B. C. Todd, et al, 25 Acre Tract, Wm. Castleberry Survey, Gregg County, Texas.

Hearing Held in Austin, Texas,  
State Capitol,  
March 11, 1938, 1:30 P. M.,

Before

R. C. Granberry, Chief Deputy Supervisor.

Record Prepared by Louise Kirk, Oil & Gas Division,  
Railroad Commission, Austin, Texas.

## Appearances:

Rice M. Tilley, Fort Worth, Texas,

A. H. Rowan, Fort Worth, Texas,

Representing: Rowan &amp; Nichols, Applicants.

L. F. Burke, Longview, Texas,

W. R. Robinson, Gladewater, Texas,

Jack Hearrell, Gladewater, Texas.

Representing: R. M. Wood, Protestants.

J. B. Robertson, Austin, Texas,

Representing: Magnolia Petroleum Co., Shell  
Petroleum Corp., Protestants.

J. A. Rauhut, Austin, Texas,

F. E. Heath, Dallas, Texas,

Representing: Sun Oil Co., Protestants.

R. O. Garrett, Shreveport, La.,

Representing: Arkansas Fuel Oil Co., Protestants.

J. W. Stayton, Austin, Texas,

Representing: The Atlantic Refining Co., Protestants.

685 Mr. Burke:

Let the record show that my client is only appearing for the purpose as will hereafter in this hearing be shown. We don't appear for the purpose of protesting the granting of these permits on a density theory but only as will hereafter be shown in the proper time.

Mr. Tilley:

Mr. Granberry, in order to make our position clear I want to state that the application to the contrary notwithstanding this application is primarily an application for an adjustment of the allowables in reference to the Rowan & Nichols tract, their Todd "B" lease, and the alleged Wood tract and so far as that is concerned, all the wells in the field.

Mr. Granberry:

If the primary purpose is for the adjustment of the allowable I think you are in the wrong Court. I think you would want a hearing before the Engineering Department of the Commission which looks after that part of the Commission's work. We have taken jurisdiction here because it was an application to drill.

Mr. Tilley:

I didn't apply to any division except the Oil & Gas Division of the Railroad Commission. We assume that the Commission will have to have before it all the facts and I don't know very well how the Oil & Gas Division of the Railroad Commission itself can divided itself up into different divisions. We asked for a hearing before the Railroad Commission and assumed that the Railroad Commission delegated you to hold this hearing. We assumed that, a record being made, the supervisor would pass on the applications for permits insofar as recommendation to the Railroad Commission was concerned and that maybe someone else would pass on the adjustment of the allowable or make a recommendation to the Commission separately, because we assume that the Commission will pass on the matter in its entirety.

Mr. Granberry:

We can hear your evidence.

Mr. Tilley:

I don't want to be understood that it is applying before any particular division of the Railroad Commission but that we are making this application before the Railroad Commission and I assume that the Commission will have all this evidence before it. But I want it understood that we are asking primarily for an adjustment in the allowable because we submit that we have sufficient wells already to adequately develop our lease and enough to give us an equal opportunity to recover our share of the recoverable oil in the pool. Therefore we ask for the permits only in the event the Commission refuses to give us what we think we are entitled to in the way of an adjustment of allowable and the Court holds that we are not entitled to an adjustment in allowable. I would like for the record to show this, Mr. Granberry,

that in this request we will submit a new application, if that be necessary or advisable, and attach one plat to the other application and ask for all the wells in one application so that your file will not be so voluminous.

Mr. Granberry:

That will be acceptable to the Commission.

Mr. Burke:

As far as R. M. Wood is concerned, as Mr. Tilley has stated it is primarily for the purpose of an adjustment in allowable, we say that this hearing is of no  
687 force and effect because it isn't before the proper tribunal. We were notified to come down here on the proposition of 17 or 18 additional wells, and if primarily the purpose is to adjust the allowable in the field, I think that is a collateral attack on Rule 37 and this tribunal—the Court would be the proper tribunal for that hearing.

Mr. Tilley:

Swear Mr. Rowan and Mr. Burke please.

(A. H. Rowan and L. F. Burke duly sworn as witnesses.)

L. F. BURKE, witness:

Questions by Rice M. Tilley:

Q. Mr. Burke, you represent R. M. Wood?

A. Yes, that is correct.

Q. You have already made your appearance here?

A. For the limited purpose as stated in the record.

Q. She has your initials? What are your initials?

A. L. F.

Q. You practice law in Longview?

A. That is correct.

Q. You got a notice within 10 days that the hearing on these applications for permits—that this application would be heard today, didn't you?

A. I didn't get notice, Mr. Wood got some character of notice. I don't know whether it was in ten days or not but he got some character of notice.

Q. Did he also get a letter from us to the effect that the application included a prayer for adjustment of allowables before this hearing?

A. I don't know about a letter.

Q. You don't know?

A. No.

Q. When was the first time you heard about the application for adjustment of the allowable?

A. I would say a few months ago.

Q. Your client didn't tell you about it?

A. Not anything about a letter. He had some kind of a sheet showing all the wells and the spacing of them.

Q. He didn't say anything about getting a letter from me?

A. I don't recall anything about a letter.

Q. You didn't know anything about the adjustment of the allowable until you got here this morning?

A. Not except what has been said here.

Q. That's all. Swear Mr. Hearrell please.

(JACK HEARRELL, sworn as a witness.)

Mr. Tilley:

Mr. Hearrell, did you hear anything about an adjustment of allowables until this morning?

Mr. Hearrell:

No.

Mr. Tilley:

Swear me, please.

(MR. TILLEY duly sworn as a witness.)

My name is Rice Tilley and I represent the Rowan & Nichols Oil Company, the applicants here, and I on behalf of the applicant filed with the Railroad Commission the applications on which this application is being held and which Mr. Granberry has agreed could be heard all in one application, which includes a letter on the stationery of Tilley & Tocker, dated February 22, 1938, addressed to the Railroad Commission of Texas, which is marked as the applicants Exhibit No. 1. I want to say that this letter was dictated in my office and 689 within forty-eight hours of the time it was dated it was mailed to all the persons named in the notice of the Railroad Commission of February 24, 1938, which is marked applicant's Exhibit No. 2, at the same addresses. Now, Mr. Hearrell or Mr. Burke, did either of you ever see this notice before?

Mr. Burke:

I believe that is what we received. What I mean by that is this is what I have seen.

Mr. Tilley:

Where have you seen that?

Mr. Burke:

Mr. Wood gave this to me but as far as a letter is concerned, I haven't seen the letter. This is the only thing I have seen.

Mr. Tilley:

Did you know—did he say anything to you about the contents of a letter from us?

Mr. Burke:

No.

Mr. Tilley:

Did he tell you he got this through the mail?

Mr. Burke:

He showed this to me. He didn't say how he got it. He gave that to me. I saw a copy of this Exhibit No. 2, the applicant's Exhibit No. 2. I have seen this, but that is all I have seen in regard to this application.

Mr. Tilley:

Is Gladewater his address? Mr. Wood's address?

Mr. Burke:

He lives in Gladewater.

Mr. Granberry:

Mr. Garrett, did you receive a copy of a letter from Mr. Tilley to the effect—

Mr. Garrett:

I did. I received that letter the first part of the week. A matter of a few days before the date of the hearing.

690 Mr. Granberry:

The letter wasn't addressed to Mr. Burke or Mr. Hearrell.

Mr. Tilley:

But the point I want him to testify about is this. I am testifying now, not just stating. We mailed this to the same persons with the same addresses as those to whom you mailed these notices. Did the Sun Oil Company get a copy of our letter dated February 22?

Mr. Heath:  
They did.

Mr. Tilley:  
Did Shell and Magnolia?

Mr. Robertson:  
I think so.

Mr. Tilley:  
You say you got a copy for the Arkansas Fuel?

Mr. Garrett:  
Yes.

Mr. Rauhut:  
Mr. C. B. Jeffrey of our office got a copy of it.

Mr. Garrett:  
We got one addressed to Arkansas Fuel and one to me personally.

Mr. Stayton:  
Atlantic got a copy.

Mr. Robertson:  
Shell and Magnolia have furnished me with copies of that letter. They don't say when they received it or that they did receive it. I assume that they did or they couldn't be furnishing a copy.

Mr. Granberry:  
I don't believe that there is any question but that this notice went to the proper persons the same as the notice. They were both sent through the mail.

Mr. Rauhut:

The letter you refer to is dated March 1st?

Mr. Tilley:

February 22nd.

691 Mr. Granberry:

That was the Commission's notice. I believe your letter is dated March 1st.

Mr. Tilley:

I believe that is correct. I was mistaken.

Mr. Granberry:

The Railroad Commission's notice is dated February 24th.

MR. A. H. ROWAN, having first been duly sworn as a witness, under oath testified as follows upon examination:

By Mr. Tilley:

Q. Mr. Rowan, your name is A. H. Rowan?

A. That is correct.

Q. What position do you hold, if any, with Rowan & Nichols?

A. I am president of the company.

Q. Are you a drilling contractor?

A. Yes.

Q. How long have you been in the oil business?

A. About 15 or 16 years for myself.

Q. You are a producer?

A. Yes, sir.

Q. How long have you been drilling wells in Texas?

A. I have been actively engaged in the contracting business for myself since January 1, 1924.

Q. Have you drilled wells in East Texas?

A. Yes.

Q. Approximately how many?

A. More than fifty. I don't know how many.

Q. Have you studied papers and textbooks on petroleum production and drilling of oil and gas wells and generally in reference to underground conditions in the production of oil?

A. Yes.

692 Q. You say you are familiar with the East Texas field because you have drilled wells there?

A. Yes.

Q. Do you have a lease in the East Texas field?

A. Rowan & Nichols Oil Company have two leases there.

Q. What is the total of the B lease?

A. It is a 25 acre lease on the William Castleberry League and Labor in Gregg County, Texas.

Q. How many wells do you have on it?

A. Five wells on the lease at the present time.

Q. I would like at this time—I think you can testify as to the number of those wells and approximately when the application was made and when they were granted.

A. The Nos. B-1 and B-2 were filed on 9/30/31 and the authority to drill was granted on 10/20/31 by the Railroad Commission. B-3 and B-4 were filed—the applications for permission to drill were filed 6/17/33 and the applications were granted by the Railroad Commission on 7/5/33. The well No. B-5, the application to drill was filed 4/30/34 and the application was granted on 5/2/34.

Q. Have you applied for those wells which are authorized under the various rules and regulations of the Railroad Commission and the spacing Rule 37 since you first drilled your first well?

A. Yes, sir, all those applications are in exception to Rule 37. The first two wells were drilled under the 20

acre spacing rule which was in effect in 1931 by the Railroad Commission and the only exception 693 which was necessary in that case was the rule which provided that the wells must be 330 feet from the property line. The width of the lease wasn't sufficient to drill a well—to make it possible to drill a well 330 feet from the lines and it was necessary to get an exception for those wells.

Q. Have you drilled all the wells the Railroad Commission would let you drill on your tract?

A. Yes, sir.

Q. As a matter of fact have you had to go to Court to force them to let you drill some of those wells?

A. Yes, we filed suit. The application was granted before the suit came to trial.

Q. But some time after it was filed?

A. Yes.

Q. Mr. Rowan, state where your lease is with reference to what we commonly refer to as the fairway in the East Texas field?

A. The lease is located on what is called the Glade-water nose and it is approximately in the center of the Gladewater nose and it is in the middle of the field so far as the east and west direction of the field goes, approximately in the middle of the field, and is one of the highest points, if not the highest point, in the East Texas structure.

Q. Do you know approximately what the sand thickness is in that area?

A. We have a known sand thickness of 90 feet.

Q. You have knowledge of that much?

694 A. Yes. It was still in the sand.

Q. It is probably more?

A. It is probably 100 feet or better.

Q. At the time this field was discovered and that area was proven, what was the estimated per acre recovery on this Todd B lease?

A. We have always estimated it to have a recovery of 700 barrels per acre foot and that was a conservative estimate placed on that area in the early life of the field. However, it is possible that the estimate may be too low. The lease may have greater possibilities than that.

Q. Have you had any reputable geologist or engineer give you any estimate of the recoverable oil per acre from that area or have you heard any estimates given by any such reputable men?

A. I haven't had any written report made on it but I have discussed the matter with geologists and petroleum engineers at various times in the last five years and that estimate seemed to be an acceptable estimate to all I discussed it with.

Q. Just discuss very briefly the sand conditions in the East Texas field generally as to whether or not they are uniform with reference to permeability and porosity and such things.

A. Generally I think they are uniform as to porosity and permeability. On the east side of the field the sand goes into shale and thickens to the west.

Q. How far would you say drainage would take place there around your lease?

A. It is all a common structure or reservoir.

Q. It is a common reservoir?

695 A. Yes. The sands are interrelated and in that particular spot right there there is quite a little bit of gravel in the sand which gives a high permeability. We know from tests that at 1320 feet the drainage will take place very quickly, 1320 feet from wells. Just how far drainage would take place I am unable to testify definitely.

Q. That showed it was a common pool or common reservoir?

A. Yes.

Q. Mr. Rowan, state what advantage the fairway, what you call the fairway, has over the east or what is called the east and west sides of the field?

A. Well, the middle of the field or fairway is the thickest—has the thickest sand thickness. The east side, of course, tapers out to where the sand gets into shale and on the west side the water comes up underneath it and it goes from the producing sand of one foot on up until it gets into this middle part of the field which is the thickest part of the producing sand in the field.

Q. Under open flow conditions what advantage would it have?

A. The middle of the field, with the greatest sand thickness would produce the greatest amount of oil.

Q. It would produce the greatest amount of oil?

A. Yes.

Q. What would happen on the west and east sides?

A. The west would go to water and the east would go to pumping.

Q. How many barrels of oil per acre per day could probably be pumped on the east while you produced with the very high potentials on the fairway, if you can give any relative percentages? Or any general estimate as to that.

A. I don't know, Mr. Tilley. Certainly the middle of the field would flow longer than the east side.

Q. What would you say the potential is on this lease, on the Todd "B" lease?

A. I would say it is somewhere between 900 and 950 barrels per hour.

Q. Now, what is the potential of the wells, as many as 400 or 500 wells on the east side?

A. They range from less than 20 barrels up to 200 or 300 barrels.

Q. Generally how many wells are on the pump in East Texas? Do you know?

A. I don't know.

Q. Do you know, Dr. Heath?

Mr. Heath:

Something in excess of 4000, I believe.

Mr. Tilley:

Will you gentlemen agree that is correct?

Mr. Burke:

No.

Q. Mr. Rowan, are there large numbers of wells in the East Texas field with a potential of not over 100 barrels that are producing within 5 barrels as much oil per day per well as your wells?

A. There are a great many wells in the East Texas field that will not produce over 100 barrels and those wells are being allowed 20 barrels per day allowable.

Mr. Granberry:

What is your allowable?

A. It is about 22 barrels. A little less than 22, I believe. It is between 21 and 22.

Q. Have you estimated what per cent of the  
697 oil per day that you should be getting if the Railroad Commission would permit you to produce that amount of oil which is the ratio between the total recoverable oil in the field and the total recoverable oil under your lease? Just use general or rough figures.

A. No, sir, I haven't made any estimate on that. The only estimate I have made is that using strictly a potential basis of allocation which is the basis which the Railroad Commission is attempting to use now, if the field was put on a potential basis solely, my allowable would be greater, compared with the number of wells—compared with some of the wells which are not able to produce as much oil as mine.

Q. Would you say three or four times as great, as much?

A. Yes, I would say more than that.

Q. Mr. Rowan, are you familiar with the location of what is known as the R. M. Wood approximately .1 of an acre tract?

A. I know where the R. M. Wood well is, yes, sir.

Q. Where is that with reference to the Todd "B" lease?

A. It is to the south of the easterly southeast corner of the Todd lease.

Q. Say that Mr. Wood has 1 acre there, although I understand that you are now questioning his title to that, is that right?

A. I don't know—I don't question his title to the tract that well is on because I think the well is 6 feet south of our line.

Q. I mean you don't claim it is his land?

A. No, I don't. The land which he is claiming I don't think is his land.

Q. If he has 1 acre there—you have how  
698 many acres in your "B" lease?

A. 25.

Q. Then with one acre there he is producing per well approximately the same that you are producing from any one of your wells?

A. That is right.

Q. Are all your wells producing from the same formation and under the same sand conditions that his well is producing from?

A. I think so.

Q. And if he has one acre then you have just 25 times as much acreage as he has?

A. That is correct.

Q. And as much sand as he has?

A. I think the same thickness is the same on both leases.

Q. And if he has only .1 of an acre then you have 250 times the advantage, is that right?

A. That is correct.

Q. Are you complaining of the Railroad Commission permitting them to produce as much oil from that well on .1 of an acre as you are producing from 5 acres per well on your 25 acres?

A. I am. That well and other wells in the field.

Q. In other words, your hands have been tied so that you can't drill any more wells and they refuse to give you any increased allowable to take care of that discrimination.

A. They have unless they grant it now.

Q. They have heretofore refused you permits?

A. Yes, that is correct.

Q. And Mr. Rowan, I will ask you whether or not there are innumerable tracts in the East Texas field which have at least two or three wells on tracts of 5-699 acres or less?

A. Yes, sir, there are.

Q. You are complaining of that condition also?

A. Yes.

Q. Mr. Rowan, if the Railroad Commission would give you the allowable which you think would represent your proportionate—give to you eventually your proportionate part of the oil in that pool—would it be unnecessary for you to drill any other wells?

A. It would be.

Q. Can you produce as much as 300 barrels or 200 barrels a day from those five wells without creating any unnecessary waste?

A. How many barrels?

Q. 250 to 300 barrels.

A. Yes.

Q. Could the Railroad Commission of Texas enter an order adjusting the allowable of all wells in the field on a potential and/or acre of oil sand basis disregarding

the marginal well law and prevent discrimination between wells unfavorably situated as against those favorably situated without creating unnecessary waste?

A. Yes, sir, they could.

Q. In other words, that condition could be relieved without increasing the present daily allowable for the East Texas field?

A. It could.

Q. You can recover, can you, Mr. Rowan, all  
700 the recoverable oil under your lease with the exception of a very few barrels with the number of wells you already have?

A. I would say you will never recover all the oil from any sand in any field but we have enough wells on our lease that we think will economically drain the lease if it is properly produced.

Q. The drilling of additional wells, is the drilling of additional wells conducive to waste or prevention of waste?

A. It depends on how you allocate the allowable. If you allocate the allowable on a strick per well basis without other factors it is conducive of waste.

Q. In the East Texas field would you say the drilling of additional wells would be conducive to waste under the present conditions and orders?

A. It probably would be with the very dense drilling, maintaining the same allowable that is maintained now.

Q. What about fire hazard?

A. It is conducive to fire hazard.

Q. The drilling of additional wells?

A. Yes. That has been demonstrated by the fire in Kilgore recently.

Q. Unless the Railroad Commission does permit you to increase your allowable and/or decrease the allowable of the Wood well proportionately or drill additional wells, then your oil is going to be confiscated?

A. We feel that way, yes, sir.

Q. At lease your equal opportunity to produce that oil is going to be paralyzed or frozen or retarded?

A. Yes, I think that we are going to lose some oil. There will be some drainage taking place from our lease.

Q. Substantial?

A. Yes.

Q. Mr. Rowan, have you drilled your wells with reasonable diligence since your discovery of oil there—since oil was discovered in the immediate area where your lease is situated?

A. We think we have. We drilled the first two wells under the Railroad Commission's orders which granted one well to each 20 acres in the East Texas field and we waited over a year before we drilled any more because we thought that was the law and that the orders of the Railroad Commission were going to be enforced covering the drilling density of 1 well to 20 acres except on small tracts where an exception might be made to take care of that small tract. It became apparent to us that we were going to have to drill more wells or lose our oil and we made application and drilled additional wells. We think that we have protected ourselves as good as we could up to this time with the opposition that we have had in getting additional wells granted.

Q. Under the present orders?

A. Yes, under the present orders.

Q. You mean you have exerted every effort that you possibly could?

A. Yes.

Q. You stated you drilled every well the Railroad Commission under its rules would let you drill?

A. That is correct.

Q. And so drilled those wells if the Railroad Commission had or will hereafter give you an allowable to which you are entitled up to this time or which you would be entitled to hereafter you

could produce the amount of oil which you estimate is the recoverable oil under your lease, to-wit, originally about 70,000 barrels per acre?

A. I think we could.

Q. How do you—how much do you estimate is your per acre recovery now?

A. It is around 57,000 or 58,000 barrels per acre.

Q. Will you ever get that much oil under the present conditions?

A. Not unless we drill more wells or there is a change in the method of allocation. I think—I don't think we will.

Q. Will the drilling of further wells allow you to recover that if the Railroad Commission gives other operators the right to drill too?

A. I don't think so.

Q. The drilling of additional wells will not necessarily give you the amount of oil which you think you are entitled to recover under the theory we proposed awhile ago unless they give you a large number of wells?

A. If they granted these 20 permits, is that what you are talking about?

Q. If they granted 5 permits, would that give you the recoverable oil?

A. I don't think so, Mr. Tilley.

Q. Was there anything, any obstruction of any kind, on this alleged Wood tract to have kept him from drilling sooner if he wanted to?

A. Not that I know of, if he owned the land.

703 Q. There was no physical condition out there which would have kept anybody from drilling a well on that area?

A. No, sir.

Q. That is all. I would like to ask Mr. Robinson a question. You have heard the testimony of Jo J. White and you have made some investigation with reference to the Wood tract. Will you testify approximately what

that figured acreage of the alleged R. M. Wood tract is in the Castleberry survey?

Mr. J. B. Robertson:

I haven't calculated it and I don't know and couldn't answer your question except that Mr. White testified—his testimony was to the fact that he didn't have any acreage and the testimony of the other surveyor was—I don't know really just what acreage the other surveyor said.

Mr. Tilley:

You have studied that abstract and know whether or not there was more than an acre, don't you?

Mr. J. B. Robertson:

It is my recollection that Mr. Wood never claimed but one acre but I couldn't make any statement as to what acreage is there under any of the contentions. I am sorry.

Mr. Granberry:

Mr. Hearrell, do you know how much acreage the applicant claimed there?

Mr. Tilley:

Mr. Robinson was in that case. Mr. Robinson, how much did you state?

Mr. W. R. Robinson:

One acre.

Mr. Tilley:

You surveyed that?

Mr. Robinson:

Yes.

704 Mr. Tilley:

There was some question or controversy as to whether it was .1 of an acre or 1 acre?

Mr. Robinson:

By moving the lines around it could be computed at any acreage. The plat submitted showed one acre.

Mr. Tilley:

Mr. White claimed under your field notes there was .1 of an acre, didn't he?

Mr. Robinson:

I don't recall that.

Mr. Tilley:

You didn't hear his testimony?

Mr. Robinson:

No.

Mr. Tilley:

That is all.

Mr. J. B. Robertson:

I want to correct my statement that the applicant claimed only one acre. I understand that Mr. Wood claimed he owned other land in that vicinity to the north of the tract on which he made application and that his statement was that he hadn't included in the application all of the land which he contended he owned and I believe he further testified that he thought probably he had lost title to a good deal of it by limitation and as to some of the other excess he thought he could recover it but I don't—I wouldn't—he hadn't yet attempted to do so but was restricting his application to the area shown within the lines on the plat which he

submitted in connection with his application for Wood No. 1 and it was my understanding that it has never been contended that contained more than one acre.

Mr. Tilley:

You know from Mr. Robinson's testimony and other testimony that the tract to which he is claiming title is now under his permit and in the litigation which has been had one acre or less?

705 Mr. Robertson:

I couldn't really say that it is actually there. All I can say is what he claimed.

Mr. Rauhut:

That question of acreage was discussed in that hearing on the application of R. M. Wood and surveyors testified. As far as we are concerned and to shorten the record we would be willing to consider that testimony in the record if it is necessary here.

Mr. Granberry:

Let the file reflect that.

Mr. Tilley:

I don't want to offer that record in evidence. I do want to state this myself as my testimony that Jo J. White, licensed surveyor, made a survey of the Shell tract which is immediately south of the Wood tract and his testimony was according to the plat that Mr. Robinson prepared according to any construction of the field notes there couldn't be more than 1/10th of an acre there between the Shell lease and the Rowan & Nichols lease. That is all.

## Cross Examination of Mr. Rowan.

By Mr. Rauhuts:

Q. Mr. Rowan, do I understand that you have no quarrel with the top allowable for the field?

A. That is correct.

Q. You think that it is necessary to have a top allowable for the field to prevent waste in the field?

A. I think it is very necessary to have it.

Q. You have no quarrel with the present top allowable for the East Texas field?

A. No.

Q. Do I understand further you have no quarrel with Rule 37 as being necessary and that there should be some restriction in the number of wells drilled in the field to prevent waste?

A. I think that Rule 37 is a good rule and that you should have a rule governing the orderly development of a field and also for the prevention of fire.

Q. I understood some statement was made awhile ago that you had an advantage—if the Wood tract has .1 of an acre you would have an advantage of 250 to 1 over Wood; is that your statement?

A. In acreage.

Q. What about the allowable?

A. Not necessary in allowable. Actually I wouldn't have.

Q. In allowable your allowable is how much? What ratio as compared to his?

A. It is the same now.

Q. Per well?

A. Yes.

Q. Five times as great on your lease then?

A. Yes, I think it is.

Q. Approximately 5 times. Your lease is approximately 5 times his lease allowable?

A. Yes.

Q. You say that you probably will under the present set-up lose oil by drainage to other leases?

A. Yes, sir.

Q. Do you contend that you are suffering any drainage—that your lease is suffering any drainage to the Sun Oil Company wells?

A. No, sir, I don't. I think the Sun Oil Company is suffering the same drainage that I am suffering.

Q. Those leases adjoining your lease which have a similar density as your lease or no density advantage over your lease, do you contend they are draining any oil?

A. No, I don't.

Q. The leases which have a density advantage over your lease are the ones which are draining your oil? Under the present set-up?

A. That and the leases situated on the structure in a less favorable position than mine are causing some drainage. Those immediate leases around me are situated in about the same position on the structure. I don't think there is any drainage taking place there.

Q. Which of those leases adjoining you? The ones similarly drilled? Drilled to a similar density?

A. Similar density and about the same position on the structure.

Q. That is all the questions I have.

#### Re-Direct Examination.

By Mr. Tilley:

Q. Mr. Rowan, I want to ask one question. You say that you have no crow to pick with Rule 37. You mean you have no crow to pick with reasonable drilling regulations?

A. That is right. My understanding of his question was an abstract question as to whether we should have

Rule 37, just a spacing rule governing drilling and spacing of wells in any field. I think you should have a rule.

Q. You mean a uniform rule which means something and you don't mean with a limitation in it that there shall be some exceptions from that rule.

A. I feel about like Judge Hutchinson did  
708 when we tried that suit before him that the rule should be the rule and not the exception.

Q. The tail should not be wagging the dog?

A. That is correct.

Mr. Granberry:

You mean there should not be exceptions to the rule?

Mr. Tilley:

That is different. I don't mean that. It should be a uniform spacing rule. I understand there must be exceptions to it.

Mr. Granberry:

Isn't that what Rule 37 provides?

Mr. Tilley:

I don't know what Rule 37 provides but if it provides what the policy of the Commission has been under it then I say it isn't my conception of what a uniform spacing rule should be.

Mr. Granberry:

It provides that wells in the East Texas field shall be spaced 330 feet from the property lines and 660 feet apart and provides that exceptions to the rule will be granted to prevent confiscation of property.

Mr. Tilley:

To protect vested rights. I understand that. That is what I object to. I say that Rule 37 should have an exception to it but there should be another rule—

Mr. Granberry:

It provides—then you are complaining about the administration of it and not the rule itself.

Mr. Tilley:

Yes, I am complaining about the administration of it:

709 Mr. Rowan:

I would like to make a statement for the record that there have been more exceptions to Rule 37 in the East Texas field than there have been wells drilled under the rule itself.

Mr. Granberry:

How many of your wells are exceptions?

Mr. Rowan:

Every one of them.

Mr. Tilley:

You understand, Mr. Granberry, I don't think that anybody who has a tract of land who has acted in good faith and who has a sufficient amount of oil to justify its recovery of it should be prevented from recovering it. My objection to Rule 37 if it means what the policy of the Commission has been, which I assume is the Commission's interpretation that one well can be drilled on 5 or 10 acre tracts and permits refused for additional wells on that tract whereas another lot in the same field which has a common reservoir gets three wells and that lot is 50 by 100 feet, then I say that isn't uniform spacing according to my mind. I'm not criticizing you but I am criticizing the rule.

Mr. Granberry:

I think the rule is as uniform as it could be and provides exceptions. It must be the administration of the rule that you criticize.

Mr. Tilley:

Let me ask you this question, Mr. Granberry. Do you think that Rule 37 should be so construed and so enforced without any other rule taking care of property rights which will give R. M. Wood one well on 1 of an acre and Rowan & Nichols Oil Company on the same structure and in the same part of the field just the same allowable per well with 25 acres; is that your conception of what a spacing rule or producing rule should be?

710 Mr. Granberry:

We will hear the application now to drill additional wells on the tract. That would come up afterwards.

Mr. Tilley:

You understand what I am trying to bring out that we don't need any more wells to get that oil but what we need is more allowable.

Mr. Granberry:

You are asking for more wells whether you need them or not.

Mr. Tilley:

Only in the event you absolutely refuse upon this request to give us an adjustment in allowable which will give us what we are entitled to. Mr. Hearrell, what is the allowable of the Wood well?

Mr. Hearrell:

22 barrels.

Mr. Rauhut:

I want to ask Mr. Rowan a few questions:

Questions by Mr. Rauhut; answers by Mr. Rowan:

Q. Mr. Rowan, where there is one tract adjacent to another, having similar field conditions and sand conditions and one having an advantage over the other in allowable from the standpoint of the ratio of resources in place to such allowable there are two ways to adjust the allowable, aren't there? One is to reduce the allowable of the well or lease that has the advantage and the other is to increase the allowable of the lease which has the disadvantage.

A. That is correct.

Q. One means is just as effective as the other from the standpoint of adjustment, isn't it?

A. That is correct. I guess you mean from the standpoint of equity?

Q. Yes.

A. Yes.

Mr. Granberry:

How would you determine how much oil to allow a lease half a mile from the east edge of the field and one a mile from the east edge? How would you determine just what was the proper amount?

A. There are several factors which I think should be taken into consideration. One of them is potential and potential has a relation to permeability. Another one is the amount of acreage which that well is draining. Another one is the thickness of the sand which that well is draining. I think those are the most important factors which should be taken into consideration.

Mr. Granberry:

It would be pretty hard to make it exact and give every lease what it was entitled to, wouldn't it?

A. I think it would be impossible to make it exact but I think you could get it probably 300 or 400% more accurate than it is right now.

Questions by Mr. Tilley:

Q. You mean using the Railroad Commission's own map and own figures and own well core records and things like that?

A. Yes, they have all that information, all the information necessary.

Q. The Railroad Commission has the information necessary to do this if they wanted to resort to it and use it?

A. They do have, yes, sir.

Mr. Tilley:

I would like to ask Mr. Heath a question. How many wells are in East Texas?

Mr. Heath:

I haven't been sworn.

Mr. Tilley:

That's all right.

Mr. Heath:

About 25,000, a few less.

Mr. Tilley:

Do you know what the average density of the field is?

Mr. Heath:

It would be 25,000 divided into 134,000.

Mr. Granberry:

Approximately 5.4 acres per well, I think, or in that neighborhood. That would be pretty close for the average density.

Mr. Heath:

Five and a fraction. I think that the average figure I was using was a little higher than the figure you used, Mr. Granberry, as to the acreage. I used 134,000 acres. It would be 25 into 134.

Mr. Tilley:

I know you couldn't answer this question exactly but generally would you say the fairway was about as densely drilled on the average as the rest of the field?

Mr. Heath:

I expect there is a little greater density in the fairway.

Mr. Tilley:

A little greater?

Mr. Heath:

Yes.

Mr. Tilley:

How many acres would you estimate are in what is commonly referred to as the fairway?

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Mr. Heath:

About five acres per well. I would think so.

Mr. Tilley:

How many acres of the proven acreage would you estimate are in the fairway, just generally?

Mr. Heath:

That depends on what you call the fairway.

Mr. Tilley:

You mean between what limits?

Mr. Heath:

I am speaking of the fairway as being through the middle of the field but it might be construed to be very wide or very narrow.

Mr. Tilley:

What would you say would be the total number of acres approximately in the East Texas field with an average sand thickness, with a sand thickness of 60 feet or more?

Mr. Heath:

Formation thickness or sand thickness?

Mr. Tilley:

Saturated sand thickness.

Mr. Heath:

I couldn't even give an estimate on that.

Mr. Tilley:

The sand pinches out in what manner?

Mr. Heath:

The sand was laid down and later eroded and—by pinching out you mean, I presume, on the east side?

Mr. Tilley:

Yes.

Mr. Heath:

The section equivalent to the sand is no longer present in the east side because of erosion. It is gone.

Mr. Tilley:

You don't happen to have with you a map showing the picture of the sand there, do you, under the present

conditions where the water has encroached up to the present time?

714 Mr. Heath:

No, I don't, except that there must have been a considerable water encroachment.

Mr. Tilley:

Mr. Rowan, I believe you stated that you weren't getting the amount of oil you were entitled to with reference to your position on the structure with relation to the whole field?

Mr. Rowan:

I stated in my opinion that I wasn't.

Mr. Tilley:

Basing that on your information and all of what you are familiar with and what you testified and what you heard Mr. Heath testify?

Mr. Rowan:

Yes.

Mr. Tilley:

That is all.

Mr. Granberry:

We will hear any further questions from any objectors.

Mr. Rauhut:

The position of the Sun Oil Company is that it protests the granting of additional wells on this lease. We don't make any protest on the matter of adjustment of the allowable as far as that question is raised here. However, we state that of course since we have ap-

peared we want it understood that it is without prejudice to our own rights to have an adjustment of allowable if any adjustment is made. We desire to offer in evidence as the Sun Oil Company's Exhibit No. 1 the plat of the Rowan & Nichols Todd "B" lease and the wells thereon and the surrounding leases and wells and ask that it be identified as our Exhibit No. 1.

Mr. Granberry:

I will mark it Sun's Exhibit No. 1.

715 Mr. Tilley:

We have permission to introduce a larger map of this whole area. We will call that the applicant's Exhibit No. 3.

Mr. Rauhut:

In connection with the map marked Sun's Exhibit No. 1 we desire to offer in evidence a density statement of the adjoining leases, the result of which shows that the average density of the adjacent leases is 5.588 acres per well compared with Rowan & Nichols' present density of 1 well to each 5 acres.

Mr. Tilley:

What area does that cover?

Mr. Rauhut:

All adjacent leases.

Mr. Granberry:

Does that include the Wood lease?

Mr. Rauhut:

Yes, counting it as 1 acre as provided or specified in the application.

Mr. Granberry:

Whether it is 1 acre or less wouldn't affect this statement to any appreciable extent.

Mr. Rauhut:

We ask that that statement be marked the Sun's Exhibit No. 2.

Mr. Burke:

Our position would be that that is a conclusion on the part of the Sun Oil Company about the adjacent density.

Mr. Granberry:

That is based on actual figures as to acreage and the number of wells on the leases.

Mr. Rauhut:

The Commission's file shows the number of wells and the acreage of the leases. As Sun's Exhibit No. 3 we desire to offer in evidence a density comparison comparing the applicant's lease with the density of the surrounding area included within a circle drawn on the Sun's Exhibit No. 1, which circle has a diameter of such size as to enable it to include the surrounding area

8 times the size of the Rowan & Nichols Todd lease. This density statement shows the surrounding area within that circle is drilled to 4.762 acres per well, which is a fraction less than the Rowan & Nichols density. Dividing the 4.762 into the Rowan & Nichols' acreage of 25, it would appear that Rowan & Nichols would have to have 5.25 acres. About a quarter of a well extra would equal the surrounding density.

Mr. Granberry:

It would take .25 of a well to have an equal density.

Mr. Granberry (Ruhut):

Yes. We submit on that basis they are not entitled to another well on density.

Mr. Burke:

With reference to that statement and the introduction of that particular sheet of paper I want to take the position that we don't admit it is true. In other words, I object to it on the ground that it is a conclusion on their part.

Mr. Granberry:

As a conclusion?

Mr. Burke:

Yes.

Mr. Granberry:

Why is it a conclusion if it is based on facts?

Mr. Burke:

If it is based on facts, then my objection is no good. I don't want to sit here and take the position that we are admitting that these facts and figures are correct. That is our only position. We don't want to sit here and by our silence admit these things are true and correct. If they are true, we can't get around it. I don't know whether they are true or not.

717 Mr. Robertson:

The Shell Petroleum Corporation offers a density plat showing a comparison of 8 times the area showing that the 8 times area density is the same as the present density of the Rowan & Nichols Oil Company.

Mr. Granberry:

That is based on a square area and not a circular or rectangular area?

Mr. Robertson:

Yes.

Mr. Burke:

I make the same objection for the same reason. We object to this because we think these companies are plotting against us after we have won in the District Court.

Mr. Garrett:

I would like to say that the Arkansas Fuel Oil Company has had no correspondence with Rowan & Nichols Oil Company with relation to these permits and the permit for the Woods lease other than the letter previously introduced in the record which the attorney representing Rowan & Nichols sent to us as they did to all other operators in the area.

Mr. Rauhut:

I would like to make the same statement for the record on behalf of our clients. The only correspondence we have had with Rowan & Nichols was the letter supplementing the notice sent out by the Commission saying what else would come up at this hearing and we are here in response to the notice.

Mr. Garrett:

There has also been no oral or written communication between us.

Mr. Robertson:

As far as I know the Magnolia and Shell have had no communication of any sort further than as stated

by these other parties and they both protest—each of these companies protest the granting of any of these permits on the ground there is no justification thereof shown by the evidence and no facts shown which would justify the granting of an exception to Rule 37. With regard to the application for adjustment of allowable, neither of these companies has anything to say at this time.

Mr. Garrett:

The Arkansas Fuel Oil Company wishes to adopt the density statements and figures introduced in this record and protest the drilling of these wells on density grounds. However, we wish to call the Commission's attention to the fact that our Stevens lease located immediately to the northeast of the Wood tract and to the east of the Rowan & Nichols Todd tract is in relatively the same position as the Rowan & Nichols lease with regard to drainage conditions as testified to here. We feel that if any adjustment is made relative to these tracts, if the Commission deems that necessary, that we be made a party to such adjustment and that it is our opinion that the forcing of the Arkansas Fuel Oil Company to drill additional wells would be a confiscation of their property as it is our opinion that we have sufficient wells thereon to drain the recoverable oil from this tract if allowed to do so by the proper application of the police powers of this Commission.

Mr. Rauhut:

I would like to make a supplemental statement. I say the Sun Oil Company has no protest as far as the matter of adjustment of allowable is concerned. I would like to explain that. We might have a protest against some specific manner of adjusting the allowable. We don't know what sort of adjustment—if the Commission adopted any, we don't know what the Commission would adopt

719 and there has been no specific plan proposed and when it gets down to the specific problem, we might have some objection.

Mr. Granberry:

We understand that.

Mr. Rauput:

I mean the Sun Oil Company has heretofore requested the Railroad Commission to adjust allowables and we believe in the general proposition. We have no objection to the general proposition of adjusting the allowable. I don't want to be understood as agreeing that some specific adjustment that the Commission might make would operate fairly toward our leases. I don't want to be in that position. I don't know what the Commission or anybody else has in mind about specific adjustment or specific orders, if the Commission should see fit to adopt an order. I think it would be more appropriate for me to state as far as adjustment is concerned that we don't have anything to say on it.

Mr. Granberry:

I think your position is clear with reference to allowable.

Mr. Burke:

I want to introduce as our sole and only reason we have, except as heretofore stated, for the purpose of protesting the granting of the wells on certain portions of the said lease is that there is a bona fide title dispute as to a certain portion of the Rowan & Nichols oil and gas lease and I offer in evidence as our Exhibit No. 1 a certified copy of the petition filed in the District Court of Gregg County, Texas, and the certificate thereof as to a lawsuit which has been filed against the parties

named in the certified copy of the petition which is offered in evidence.

720 Mr. Granberry:

That will be Wood's Exhibit No. 1. Does that involve the title to this part of the Rowan & Nichols lease?

Mr. Burke:

Yes. It involves the title to the southern portion of the Rowan & Nichols lease. R. M. Wood filed it in trespass to try title.

Mr. Granberry:

Anything else for the record? Case submitted.

The State of Texas,

County of Travis.

I, Louise Kirk, an employee of the Oil & Gas Division of the Railroad Commission of Texas, do hereby certify that the above and foregoing is a true and correct transcript of my notes made at the hearing held in Austin, Texas, at 1:30 P. M., March 11th, 1938, to the best of my skill and ability.

Witness my hand on this the 12th day of March, 1938.

(Signed) LOUISE KIRK.

Sworn to and subscribed before me, a Notary Public in and for Travis County, Texas, on this the 12th day of March, A. D. 1938.

(Signed) ROSE MODRALL.

(Seal)

Notary Public in and for  
Travis County, Texas.

721

## Railroad Commission of Texas.

## Oil and Gas Division.

Oil & Gas Dockets Nos. 108, 120, 123, 124, 125, 126, 128,  
129, 132 and 146.

In Re: Conservation and Prevention of Waste of Crude  
Petroleum Oil and Natural Gas and Relative to the  
Production, Storage, Transportation, Marketing or  
Processing of Crude Oil and or Natural Gas and  
Relative to the Purchase, Sale, Transportation and  
Handling of Crude Oil and Natural Gas and All  
Products, By-Products and Derivatives Thereof in  
the State of Texas.

Statewide Hearing Held in the City of Austin, Texas,  
March 19, 1938.

## Before

Hon. C. V. Terrell, Chairman,  
Hon. E. O. Thompson, Commissioner,  
Hon. Lon A. Smith, Commissioner.

## Appearances.

(Statewide Hearing 3-19-38.)

## Name — Representing — Address.

Baker, Rex. G., Humble O. & R. Co., Houston, Tex.  
Bartlett, W. O., Wynn Crosby Drilling Co., Houston,  
Tex.  
Bates, V. B., Glenn H. McCarthy, Inc., Houston, Tex.  
Boyd, Lynn, Panhandle Prod. & Royalty Owners Assn.,  
Pampa, Tex.

## Appearances—(Continued.)

Name — Representing — Address.

Brown, Kingston L., Grayburg Oil Co., San Antonio, Tex.

722 Buck, Raymond E., Barnsdall Oil Co., Ft. Worth, Tex.

Butler, Ira, Ft. Worth, Tex.

Byrd, L. H., Byrd-Frost, Inc., Dallas, Tex.

Caylor, Thos. L., United N. & S. Dev. Co., Luling, Tex.

Dietz, R. S., Panhandle Prod. & Royalty Owners Assn., Pampa, Tex.

Dunigan, E. J., Jr., Panhandle Prod. & Royalty Owners Assn., Pampa, Tex.

Edwards, Haynie E., McElroy Ranch Co., Ft. Worth, Tex.

Erwin, J. Ed., N. Tex. O. & G. Assn., Wichita Falls, Tex.

Figart, D. M., United N. & S. Dev. Co., Buckeye, Tex.

Flaitz, J. M., Union Producing Co., Houston, Tex.

Forester, C. G., Upton Co. Field Chamber of Commerce, McCamey, Tex.

Francis, Chas. I., Pure Oil Co., Et Al, Houston, Tex.

Garrett, R. O., Ark. Nat. Gas. Co., Shreveport, La.

Golay, Travis L., General American Oil Co., Dallas, Tex.

Goodman, James H., Mason Pool Operators, Midland, Tex.

Grant, L. S., McElroy Ranch Co., Crane, Tex.

Haves, E. P., The Texas Co., Houston, Tex.

Hock, W. C., Danciger Oil & Ref., Ft. Worth, Tex.

Holmesly, S. F., Humble O. & R. Co., Houston, Tex.

Howard, Del. Cities Serv. Oil Co., Bartlesville, Okla.

Joost, E. D., E. D. Joost Valley Oil Corp. & R. A. Welch, Houston, Tex.

Lusk, Chas. M., Self, Houston, Tex.

723 Marek, Ralph L., Stanolind O. & G. Co., Tulsa, Okla.

Mayfield, M. L., Cities Service Oil Co., Glade-water, Tex.

## Appearances—(Continued.)

## Name — Representing — Address.

Miller, J. S., Devonian Oil Co., San Antonio, Tex.

Myers, Ramond, Magnolia Pet. Co.

Neely, Harold G., West Central Texas Oil & Gas Assn.,  
Ft. Worth, Tex.

Noland, J. S., Barnsdall Oil Co., Tulsa, Okla.

Owens, Joe, Sun Pipe Line Co., Beaumont, Tex.

Parks, A. S., Conroe Operators, Houston, Tex.

Perlitz, Chas. A., Jr., Strake Pet. Co., Houston, Tex.

Powers, W. B., Magnolia Pet. Co., Rodessa, La.

Price, R. J., Transwestern Oil Co., San Antonio, Tex.

Reeves, Gartnet, Panhandle Prod. & Royalty Owners  
Assn., Pampa, Tex.

Rowan, A. H., Rowan & Nichols Oil Co., Ft. Worth, Tex.

Schroeder, John C., E. Tex. Ind. Pet. Assn., Longview,  
Tex.

Small, C. C., Cosden Oil Co., Amarillo, Tex.

Smith, Selwyn S., Upton Co. O. & G. Assn., McCamey,  
Tex.

Tilley, Rice, Rowan & Nichols Oil Co., Ft. Worth, Tex.

Warner, C. A., Houston Oil Co. of Tex., Houston, Tex.

Williams, D. E., Danciger O. & R., Inc., Pampa, Tex.

Williams, R. A., O. & G. Committee C. of C., McCamey,  
Tex.

Wilson, E. B., Stanley Gill, Houston, Texas.

724 Mr. Rice Tilley:

Mr. Chairman, did you call the East Texas  
field proper?

Chairman Terrell:

Yes, sir.

Mr. Tilley:

I represent the Rowan & Nichols Oil Company, which  
have applied for an adjusted allowable in the Castleberry

Survey in the East Texas Field, and we would like—I presume that the Commission has heard the record that has been made wherein we made that application, but, for fear it has not, and for other reasons, we would again like to re-urge our application, and we have reduced it to writing in the form of an affidavit, and we do hope that the Commission will give it proper consideration.

Commissioner Thompson:

Rule 37.

Mr. Tilley:

No, sir, Colonel. We ask for an adjustment of allowable, and, tentatively, in the event as a matter of right or law we would not have the right to demand an adjustment in allowable, then we ask, tentatively, for the granting of additional permits. We take the position that we ought to have sufficient wells to properly drain our property and properly produce our prorata part of the oil, and we don't think it necessary to get the additional wells. Nevertheless, the Commission has granted us an additional well the other day.

Commissioner Thompson:

Upon your application, was it not?

Mr. Tilley:

On our alternative application, Colonel. We insisted that we did not need any more wells; on the contrary, we urged that we could recover our fair share  
725 of the oil if permitted to do so through the wells we already have, and also proved to what we thought was our satisfaction that in adjusting the allowable and letting us recover our oil that way it would be in the prevention of waste, whereas to drill additional wells it would be conducive to waste.

Commissioner Thompson:

How many wells did you wish to drill?

Mr. Tilley:

Colonel, we have five wells on 25 acres now.

Commissioner Thompson:

You want to drill 20 more?

Mr. Tilley:

We want to drill 20 more wells if we have to in order to get what we are entitled to. The Commission has granted an alleged offset owner of approximately one-tenth of an acre a well, and we have about 250 times as much oil as he has, and we ask that we be permitted to recover proportionately on the same basis that he is.

Commissioner Thompson:

How much oil would that give your property—allowable?

Mr. Tilley:

Taking into consideration what he is getting, we would get 250 times as much as he is getting now, which would be 250 times 22 less 110. Now, Colonel, we would not ask that we be put on the basis whereby we won't be discriminated against so far as that particular operator is concerned, but we have shown, we believe, that we are being very rankly discriminated against so far as the whole field is concerned and we are being denied our fair opportunity to recover the oil.

Commissioner Thompson:

You want 250 times as much as your neighbor?

726 Mr. Tilley:

No, Colonel; we would like to have that, but, instead of that, we think that the Court can fairly and equitably take care of the situation without doing that, because we realize that you have a limit to the top allowable, and that the thing you are going to have to do is to reduce his allowable and increase our allowable.

Commissioner Thompson:

That is Brown versus Humble, isn't it?

Mr. Tilley:

That is one of the cases, but we rely not only upon Brown versus Humble and other cases involving proration orders, but we rely on fairness and equity.

Commissioner Thompson:

Couldn't we do it by cutting him down to 250ths of what he is now getting?

Mr. Tilley:

That would not relieve our situation, because we would still be suffering confiscation, because the Commission has granted so many exceptions to Rule 37 that he is not the only one who is put into the position of being discriminated against, but these other operators on smaller tracts are also taking our oil.

Commissioner Thompson:

I thought that was settled years ago—all of this.

Mr. Tilley:

I didn't think it was.

Commissioner Thompson:

You haven't heard it for a long time.

Mr. Tilley:

I think it has been settled in Brown versus Humble, but I don't think it has been settled with the Commission.

Commissioner Smith:

Rice, how much increase in the allowable of the wells you have on the 25 acres would be required to bring you up to what the well on one-tenth of an acre is now producing?

Mr. Tilley:

You mean in order to give us an opportunity to produce on the same basis that he is now producing?

Commissioner Smith:

Yes; how much would your allowable have to be increased on the wells that you have on that 25 acres now to bring you up in line with the man who has a well on one-tenth of an acre?

Mr. Tilley:

Senator, it would be 250 times 22, *inus* 110, which is our allowable for that field. If you would put us on the basis which we think we are entitled to, we would be getting approximately 240 barrels per day instead of 110.

728 The State of Texas,  
County of Travis.

I, W. E. McGuire, Official Reporter for the Oil and Gas Division, Railroad Commission of Texas, hereby certify that the above and foregoing 8 typewritten pages constitute a true, full and correct transcript of the evidence adduced and proceedings had at a Statewide hearing held by said Railroad Commission in Austin, Texas, March 19, 1938, insofar as same related to or concerned the application of Rowan & Nichols Oil Company for an adjustment in allowable; all to the best of my skill and ability. I further certify that same is a part of the

official transcript of said hearing now on file with the Railroad Commission of Texas.

In testimony whereof I have hereunto set my hand and affixed the seal of the Railroad Commission of Texas this the 24th day of March, A. D. 1938.

(Signed) W. E. McGUIRE,

(Seal)

Official Reporter, Oil & Gas  
Division, Railroad Commission  
of Texas.

729 Railroad Commission of Texas.

Oil and Gas Division.

Case No. ....

In Re: Application of Rowan & Nichols Oil Company for Special Permit to Drill Wells Nos. 7 to 25 on the B. C. Todd "B" Lease of 25 Acres in the W. H. Castleberry Survey, Gregg County, Texas, or an Adjustment of Allowables.

Hearing Held in Austin, Texas,

State Capitol,

May 4th, 1938, at 10:30 A. M.,

Before:

Laten Stanberry, Chief Supervisor,

V. C. Cottingham, Director of Production,

R. C. Granberry, Chief Deputy Supervisor,

Charles Lankford, Chief Petroleum Engineer.

Record Prepared by: Louise Kirk, Oil & Gas Division,  
Railroad Commission, Austin, Texas.

Appearances:

Rice M. Tilley, Trinity Life Bldg., Fort Worth,  
Texas.

A. H. Rowan, Trinity Life Bldg., Fort Worth, Texas,  
Representing Rowan & Nichols, Applicants.

J. B. Robertson, Austin, Texas,  
Representing: Shell Petroleum Corp.

J. W. Stayton, Austin, Texas,  
Representing: The Atlantic Refg. Co.

J. A. Rauhut, Austin, Texas,  
Representing: Sun Oil Co.

L. F. Burke, Longview, Texas,  
W. R. Robinson, Gladewater, Texas,  
Representing: R. M. Wood.

730 Mr. Stanberry:  
Is there any preliminary statement?

Mr. Tilley:

I would like to make this observation. Rowan & Nichols Oil Company, as it has heretofore pleaded or stated, takes the position that it only has five wells on its Todd "B" lease in Gregg County of about 25 acres. To be exact, 24.99 acres. And we take the position that in view of all the engineering testimony which we have heard adduced before the Railroad Commission and according to the testimony of all the engineers that they now have an ample number of wells to produce under the laws of this State and under the valid rules, regulations, and orders of this Commission, if they will promulgate such orders—to produce their fair share of the oil and to produce the amount of oil they are entitled to produce under the Constitution and laws of this State. We therefore urge in this hearing that an adjustment in allowable be made reducing and/or increasing some wells and especially increasing the wells of this applicant so that he will get his fair share of the oil and will be given an equal opportunity to produce his fair share of the oil. We think that is the relief which we should come here and ask

for and that is what we are asking for. Now alternatively we have asked for additional permits but we have asked for those permits and want it made clear right now that we are asking for those permits only in the event under the Constitution and laws of this State that is the remedy we have to pursue and not as an alternative either of which we would be satisfied with because we say now and want to make ourselves clear and understood that

731 we may not even drill any wells which you may grant us permits for because we already have the necessary number of wells to produce our fair share of the oil and we want permits only in the event not that you hold that we are entitled to them and should have them but in the event the Courts hold that that is the only remedy we have. And if there is any misunderstanding about it and if we don't have that right, we now want to withdraw any application we have for any relief other than an adjustment in the allowable. That is our purpose in having a hearing today.

Mr. Burke:

For R. M. Wood I want the record to show that we are not here protesting the granting of additional wells under the density theory but we are here protesting solely and primarily on the changing of the allowable of any well in any particular area other than the entire East Texas oil field and that this hearing should have been had on the entire field and not on any segregated part of the field. That is our only and sole purpose in being here. As I understand the statutory provisions of the law, if a hearing of this kind is to be heard, it must be had on the entire field and not on a segregated part thereof and I make the further objection that in the event there is any cutting of the allowable it would be in violation of the marginal well law and would cause the cutting below 20 barrels per well per day which is a statutory provision of the statutes of the State of Texas.

Mr. Stanberry:

Has anyone else anything to say?

Mr. Tilley:

I want to offer in evidence at this time—if I am misinformed I want to be corrected—the record of the previous hearing on March 11, 1938.

732 Mr. Stanberry:

It will be accepted.

Mr. Tilley:

I assume all that testimony will be considered just the same as if re-offered?

Mr. Stanberry:

It will be considered. Call your witnesses.

Mr. Rauhut:

That includes the exhibits?

Mr. Tilley:

All the exhibits.

Mr. Stanberry:

Everybody that will testify stand and be sworn please.

(Witnesses sworn.)

Mr. Tilley:

When was that Wood well actually drilled, Mr. Burke?

Mr. Burke:

In August, 1937. I believe it was completed about August 19th or 20th.

MR. A. H. ROWAN, having first been duly sworn as a witness, under oath testified as follows upon examination:

By Mr. Tilley:

Q. Mr. Rowan, you are the same witness who testified before on behalf of Rowan & Nichols Oil Company?

A. I am.

Q. Your name is A. H. Rowan?

A. Yes, sir.

Q. Do you know approximately how many permits have been granted by the Railroad Commission for the East Texas field since January 1, 1933?

A. About 766.

Q. This tract which Mr. R. M. Wood claims in the Castleberry Survey, Gregg County, what is the area of that lease? About 1 10th of an acre?

A. According to the information I have, yes, 733 sir. About 1 10th of an acre.

Q. Have you estimated approximately how much oil there is or was in August, 1937, under that tract?

A. According to the estimate which I made on my own tract of land which this is a direct offset to, it would be about 5700 barrels of oil under that 1 10th of an acre.

Mr. Stanberry:

How did you arrive at that figure?

A. I used the sand thickness and estimated it on the basis of 700 barrels per acre foot of said.

Mr. Stanberry:

How did you arrive at the 700 barrels per acre foot?

A. By calculation and the estimates of engineers.

Mr. Stanberry:

You had that estimate made by an engineer? That isn't your estimate?

A. Yes.

Mr. Stanberry:

That is the estimate an engineer furnished you?

A. That is correct.

Questions by Mr. Cottingham:

Q. How many feet did the Wood well penetrate?

A. I don't know just how much. I don't have the record on the Wood well at all.

Q. You made an estimate of how much oil was underneath it?

A. I made an estimate of the sand thickness but I don't know how much penetration he took in.

Q. Did you make an estimate of the amount of saturated sand?

A. Yes.

734 Q. What is the saturation factor which you used?

A. You mean saturated sand factor?

Q. No. The number of feet of saturation.

A. 100 feet.

Q. What was the saturation? Was all that 100 feet considered saturated?

A. About 80%.

Q. Have any of these wells in this area been cored?

A. Yes, two of the wells have. None of mine on that lease.

Q. You don't know how much—what is the maximum amount you penetrated?

A. 60 feet.

Q. Did you core?

A. Yes.

Q. What portion of the Woodbine section was saturated?

A. About 98% of that 60 feet.

Q. Of the 60 feet?

A. Yes.

Q. What saturation factor did you use?

A. I didn't use any saturation factor. I haven't heard that testimony given in the field.

Q. Did you have a permeability test made?

A. No.

Q. Or a porosity test?

A. No.

Q. You don't know the porosity or permeability?

A. No, I don't know the porosity or the permeability either. You mean by laboratory tests?

Q. Yes.

735 A. No, sir.

Q. How did you arrive at 5700 barrels under the Wood well as of what date? August, 1937?

A. August, 1937. I used the factor of 700 barrels per acre-foot, originally under my lease, and I calculated from that—taking from that 13,000 barrels which we have taken per acre out of our lease which would give us a total recovery of 5700 barrels.

Q. How did you arrive at 700 barrels?

A. From the estimates of engineers.

Q. That wasn't your estimate?

A. No, it wasn't.

Q. Do you know what porosity they used?

A. No, sir, I don't.

Q. Do you know the permeability?

A. No, I don't.

Q. The saturation factor of the saturated portion of the Woodbine section?

A. No, I don't.

Q. Do you know anything about the water content of the Woodbine sand?

A. Nothing except what I have read.

Q. You don't know under the Wood tract whether there is any shale or the portion that it is set on—

A. I don't know anything about the sand conditions under the Wood tract except as they are related to the sand conditions under the tract offsetting it and

736 to the tract to the south, which is the Shell's Bassham tract. One of the wells on the Shell's Bassham lease cored about 90 feet of sand and while I didn't look at all the cores, I looked at most of them.

Q. Do you know what portion of the Woodbine section is saturated or what portion is volcanic ash and what portion is shale?

A. I would say that most of it is sand. There is very little shale.

Q. Could you say definitely from observation in taking the cores out?

A. From observation I have had I would say most of it is sand.

Q. Did you come to that conclusion from looking at them or putting them to laboratory tests?

A. From just looking at them.

Q. That is all.

Questions by Mr. Tilley:

Q. You are a practical oil operator?

A. Yes.

Q. You have drilled any number of wells in the East Texas field?

A. Yes.

Q. You have personally supervised the drilling of these wells?

A. Yes.

Q. Have you attended a large number of the Railroad Commission hearings in which Mr. Cottingham, Mr. Gordon Griffin, and various engineers of the Railroad Com-

mission and other engineers have testified with reference to the East Texas field?

A. Yes.

737 Q. Have you made a very thorough study of the sand conditions over there and the permeability and porosity and water drive and gas in solution and all the factors which would go to the amount of oil content in the reservoir and the producing conditions over there in the East Texas field?

A. I would say this: I have read as much information on the field as I could procure.

Q. Has that been substantial?

A. I think it has, yes, sir.

Q. The information which you have testified about here in response to Mr. Cottingham's questions, of course that information—does your opinion corroborate the information you have?

A. Yes, sir.

Q. Mr. Rowan, does it make any difference whether the reservoir content per acre of the Wood lease is 5000 or 15,000 or 1500? Will the discrimination exist just the same?

A. I think so. I think if you use the same factor on his lease as you use on my lease, you would have the same relative discrepancy.

Q. Do the same conditions exist there under his alleged lease as exist under yours.

A. I don't think there is any question but that they are the same.

Q. Have you ever heard any engineering testimony which would indicate otherwise?

A. All the testimony and information which I have on this particular area is that conditions are reasonably and fairly uniform, the underground conditions.

738 Q. In reference to the sand conditions and permeability and porosity in this lease as compared with each of the other leases in the field.

will you state whether it is better or worse than the average?

A. I would say ours is better.

Q. Therefore regardless of what the sand conditions are under your lease and the permeability and porosity, since the East Texas field is a common reservoir and since the conditions under there which I have just mentioned are fairly uniform, it would make little difference whether you knew the exact permeability or porosity because the discrimination would still exist.

A. I think it would exist.

Q. And you still would suffer drainage?

A. Yes, sir.

Q. You have testified that there was under Mr. Wood's tract approximately 5700 barrels of oil when his well was drilled in August, 1937. That well was drilled somewhere between the first and 20th of August, 1937. It was on production then, according to their information. Now have you figured up just about how much oil that well has produced since that time up to the present time.

A. Using the Railroad Commission allowable, and I assume that the well has produced its allowable production during that period of time, it would have produced about 5400 barrels.

Q. Then within only two or three months that one well will have produced all the oil which you estimate underlaid it at the time the well was put on production.

A. That is correct.

739 Q. Will your wells come anywhere near having produced the amount of oil which underlaid them at this time?

A. No, sir.

Q. Mr. Rowan, the present allowable for your wells is what? On your "B" lease.

A. About 22 barrels.

Q. And he has the same, Mr. Wood has the same?

A. Yes, sir.

Q. Mr. Cottingham, may I ask you a question?

Mr. Cottingham:

I am not a witness. I am assisting in holding the hearing but if there is anything I could help you on, I would be glad to do it.

Mr. Tilley:

I want to know what the maximum daily allowable is in the East Texas field.

Mr. Cottingham:

25.96 barrels.

Mr. Tilley:

How many wells have over 22½ or 23 barrels.

Mr. Cottingham:

I would have to look on the schedule. It is available to you, the same as to me.

Mr. Tilley:

There would be very few wells? Do you have that schedule?

Mr. Cottingham:

I don't have a schedule with me.

Mr. Tilley:

Will you have your stenographer copy that information and put it in this record at my expense?

Mr. Cottingham:

You can put it in later on.

Mr. Stanberry:

I have a schedule here if you want it.

Mr. Tilley:

I can insert it later to save time.

740 Mr. Raubut:

Is that the whole allowable schedule?

Mr. Tilley:

No, I just want to know how many wells have allowables of 23 barrels in East Texas. Mr. Rowan, what do you figure is the per acre recovery per day with your five wells on your 24.99 acre lease? Your per acre allowable per day.

A. 4.4 barrels.

Q. 4.4 barrels?

A. Yes.

Q. What does Mr. Wood's figure?

A. Using  $1/10$  of an acre, he would have 220 barrels, at the rate of 220 barrels per acre per day.

Q. Do you have an equal opportunity to produce from that reservoir with him?

A. No, sir.

Q. Do you have an equal opportunity to produce with other wells in that field?

A. No, sir.

Mr. Cottingham:

May I interpose? What is the density of the Continental Oil Company's B. C. Todd lease immediately north of your Todd "B" lease?

A. I am pretty sure it is 1 well to 5 acres.

Mr. Cottingham:

Is that more or less than the density of your lease?

A. It is same as the density of my lease at this time.

Mr. Cottingham:

What is the density of the Arkansas Fuel Oil Company's Joe Stephens lease that corners you on the northeast?

A. I don't know.

741 Questions by Mr. Stanberry:

Q. In addition to these five wells on your lease you have another permit granted, haven't you?

A. One permit has been granted, yes, sir. But the location of it is so vague and indefinite we would have to just go out and drive a stob and drill where we wanted to.

Q. Why is it vague?

A. It says equidistant from Mr. Wood's well.

Q. Don't you know where Mr. Wood's well is?

A. I don't know where the line is.

Q. Couldn't you locate his line?

A. I haven't been able to locate it, no, sir.

Q. Isn't it a fact that you have a suit filed on the whole south end of your strip here?

A. There is a suit filed but I can't tell what he is claiming.

Q. You can't locate this line?

A. No, sir.

Q. Why?

A. Because my engineer says it isn't there. Our engineer says that our line intersects with the Bassham tract owned by the Shell.

Q. Has that 1/10th of an acre tract been litigated?

A. Yes.

Mr. Rauhut:

Was that title litigated?

Mr. Tilley:

No. We haven't tried the title. We have a case in the Federal Court involving that title or rather Shell has.

742 Mr. Cottingham:

Do you know the density of the Magnolia Petroleum Company's H. L. Foster lease to the west of your Todd "B" lease?

A. No, sir.

Mr. Granberry:

Hasn't the Wood tract been litigated in the Lower Court?

Mr. Tilley:

Just the permit and not the title.

Mr. Granberry:

I understood that title had been litigated.

Mr. Tilley:

It was to some extent as to whether there was a bona fide title dispute but our pleadings especially showed we were not litigating title but set up enough information as to show a bona fide title dispute.

Mr. Robertson:

And the Court in the judgment specifically disclaimed any adjudication of title in that case.

Mr. Cottingham:

Do you know the density of the Atlantic Refining Company's H. L. Foster lease to the southwest?

A. No, sir.

Mr. Cottingham:

Do you know the density of the Sun Oil Company's Allen Tooke lease to the south?

A. No, sir.

Mr. Cottingham:

Of the density of the Shell's R. L. Bassham, et al. lease?

A. No, sir.

Mr. Cottingham:

Or what relationship your density bears to any of these leases?

A. I think it is about the same. I think we are all drilled in this area to about the same density. Directly north of the Todd tracts there are several leases 743 which are drilled to a lower density than we are drilled to, about 1000 or 1500 feet north of our tract.

Mr. Granberry:

I believe there is a density statement in the Rule 37 file which was entered at the former hearing. That statement shows that the 8 times area is drilled to the same density as the applicant. There is also an offset lease density statement in the file.

Mr. Stanberry:

Does this density statement show that the 8 times the size of the applicant's tract is drilled to the same density as the Rowan & Nichols tract is drilled to at this time, including the well on the .1 of an acre tract?

Mr. Granberry:

Yes.

Mr. Cottingham:

The Rowan & Nichols lease has the same density as the surrounding 8 times the acreage surround it?

Mr. Granberry:

That is what this statement shows. The statement further shows that the average density of the offset leases is 1 well to 5.588 acres.

Mr. Cottingham:

What is the density of the Rowan & Nichols Todd "B" lease? How many acres do they have?

Mr. Granberry:

25 acres.

Mr. Cottingham:

And have five wells and one permit?

Mr. Granberry:

Yes.

Mr. Cottingham:

Q. What density would that make you, Mr. Rowan?

A. A little over four; about  $4\frac{1}{2}$ .

Mr. Cottingham:

About 4.25?

A. A little less than that.

744 Mr. Cottingham:

It would be 4.16 acres. Your lease has a greater density than the average of the leases surrounding you? Is that right?

A. I am not going to testify to that. It may be so. Assuming that statement is true, yes.

Mr. Cottingham:

You haven't made any calculations to determine whether that is true or not?

A. No, sir. I wouldn't undertake to say what that density was with reference to the surrounding leases at all.

Questions by Mr. Tilley:

Q. Mr. Rowan, Mr. Cottingham has just asked you some questions ..... density on the adjacent leases. By density of course you mean the number of holes drilled to the production horizon; isn't that right?

A. I think that is what he means.

Q. That is what you mean, isn't it, Mr. Cottingham?

Mr. Cottingham:

The number of wells on the offset leases surrounding the applicant's lease.

A. The number of wells and the relationship of the number of wells to the total acreage.

Q. That is what you mean by density?

A. Yes.

Q. Mr. Rowan, has the number of holes over there on your lease when there is a density of greater than 1, well to 10 acres—does that have any relation or bearing whatever in your opinion to the amount of oil which you are entitled to recover if your hands are being tied with a prorated allowable order?

A. I don't think so.

745

Q. Can you conceive of any bearing that it has to your right to recover your fair share of the oil?

A. I wouldn't think so, no, sir.

Q. What are you entitled to over there? What factor is essential? The number of holes, the pressure in the oil reservoir, or what is the factor or factors which go to your right to recover your fair share of the oil and your right to have an equal opportunity to produce with everybody else in the field?

A. I think that the amount of recoverable oil which we have and the relationship that bears to the total recoverable oil in the field is a factor which should be used and is the paramount factor in any proration order.

Q. Mr. Rowan, if these adjacent leases in the area of a half a mile of your lease were drilled to the same density that you were drilled to, would that in any way affect your right to produce your fair share of the oil if others outside of that area were draining oil from the same general reservoir? Do you understand the question?

A. No, I don't.

Q. Mr. Cottingham has indicated here by his questioning that you have no right to complain—

Mr. Cottingham:

I haven't indicated that but was just questioning him.

Mr. Tilley:

Your questions are subject to that implication.

Mr. Cottingham:

I was just asking to determine what his reaction was to my questions.

746 Mr. Tilley:

Then I will ask this question. At least remotely guessing that Mr. Cottingham's inquiry or questioning was that your answer thereto would imply that if your lease was drilled to the same density as the adjacent leases that you would not be suffering drainage and would not be having your legal rights impaired in any way. Is that true or not true?

A. I don't think that even if the lease was drilled to the same density as the surrounding leases or an area 8 times that area that that is a factor which should be con-

clusive that we are getting our fair share of the oil. We think that the field should be considered more as a whole and the amount of oil we have under our reservoir should be considered in relation to the total amount of oil under the reservoir as a whole.

Q. Then the regular spacing and uniform spacing of wells in that immediate area of your lease and the immediate adjoining acreage has no relation to your equal opportunity to produce in that field or your right to produce your fair share of the oil?

A. No, sir, not under proration.

Mr. Cottingham:

Before we get off that point, may I ask a question?

Mr. Tilley:

Yes.

Mr. Cottingham:

How many acres are proven in the East Texas field?

A. Somewhere between 126,000 and 130,000 acres, according to the best information which I have.

747. Mr. Cottingham:

How did you arrive at the conclusion which you have submitted to Mr. Tilley that you weren't getting your fair share of the field allowable?

A. We took the evidence of the sand thickness as compared to the average sand thickness under our lease.

Mr. Cottingham:

What is the average sand thickness in the field?

A. In the field? Probably about 42 feet.

Mr. Cottingham:

Did you make any calculation to determine it?

A. The average sand thickness according to the information I have is 42 feet. We have about 60 feet.

Mr. Cottingham:

Did you make those calculations or were they made by somebody else?

A. By somebody else.

Q. Go ahead and tell him what your engineer based his calculation on. The acreage was 126,200; is that right; and your acreage as compared to that was 24.99 acres.

A. The percentage of our total acreage using 126,200 acres was .0199.

Q. And the average sand thickness of the East Texas field was 40 feet.

A. We estimated the average sand thickness was 40 feet.

Mr. Cottingham:

For the entire field?

A. Yes.

Q. The sand thickness of the entire field was what?

A. We estimated our sand thickness as 100 feet.

Mr. Cottingham:

How did you arrive at the productive part of the East Texas field? Do you know?

748 A. The productive part?

Mr. Cottingham:

Yes.

A. I think it was arrived at by taking a planimeter and running around the outside of the field.

Mr. Cottingham:

Did you divide the area between the producing wells and the dry holes or run from producing well to producing well?

A. He ran from producing well to producing well.

Mr. Tilley:

He didn't take in the acreage which was condemned.

Mr. Cottingham:

If your calculation were to be correct, you would take a line more finely calculated than drawing it from producing well to producing well.

A. I assume that the field has been drilled up on the east and west. I would think so.

Mr. Cottingham:

Aren't they continuously making extensions of the East Texas field?

A. They may be but on the information we have now we only have to assume that the acreage if productive is the limits of the field at the present time.

Mr. Cottingham:

That is what you based your calculations on?

A. Yes, sir, that is the known proven acreage.

Mr. Cottingham:

Is your engineer who made these calculations present?

A. No.

Mr. Tilley:

No, he isn't present.

749 Mr. Cottingham:

You don't know how many cores he analyzed to arrive at that conclusion or whether he took the drillers' logs.

A. No, sir, I don't. Some of the information we based on the Hudnall map of the sand thickness and other information we based on the best information we could obtain in the field. You understand, Mr. Cotting, that there are 25,000 wells and that it is a pretty big job to

analyze every well separately but the Railroad Commission has the information on file to substantiate or correct these estimates. The point is that we take the position that there is a yard stick that could be used for the entire field. Having arrived at that yard stick and having arrived at that measure you could apply that measure to us and every other lease in the field and then you would do substantial equity between leases in the field.

Mr. Cottingham:

Would you go on the bases of acres or acre feet?

A. On the basis of acre feet of sand thickness.

Mr. Cottingham:

Does every acre foot have the same value in the East Texas field?

A. Not exactly but substantially the same.

Mr. Cottingham:

Does the condition of permeability and porosity have anything to do with the amount of oil in place?

A. It enters into the amount of—the condition of porosity does have a relation to the amount of oil in place. The condition of permeability has a relationship to the amount of recoverable oil.

Mr. Cottingham:

You used the recoverable oil?

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A. Yes, sir, and I think that potential is the measure of permeability.

Mr. Cottingham:

And not a measure of the amount of oil in place?

A. No sir.

Mr. Cottingham:

You might have a big well that would have a higher potential but less oil surrounding it than one which would have a lower one.

A. That is possible.

Mr. Cottingham:

And, the big well wouldn't in your judgment—it wouldn't necessarily follow that a big well would have more recoverable oil?

A. Not necessarily unless you used that as a factor. It certainly measures the permeability.

Mr. Cottingham:

That is all.

Questions by Mr. Tilley:

Q. Mr. Rowan, this information which you have based these deductions and figures from is the same information that is assembled and some of which is in the presence of the Railroad Commission and that other engineers used in making estimates and statistics.

A. I think, Mr. Tilley, that the East Texas field has been drilled up to the point where there is all the information available to the Railroad Commission which they need to determine the thickness of the sand and the porosity of the sand and the permeability of the sand.

Q. You think they have ample information right now to make an adjustment in the allowable if they wanted to make that adjustment?

751 A. I do.

Q. And Mr. Cottingham's testimony and his contour maps and the various maps substantiate the figures you have gotten up?

A. I haven't seen any of his maps—

Q. The Railroad Commission's maps. You have been at the proration hearings for some three years?

A. Yes.

Q. Haven't you seen the sand thickness map and the contour maps introduced in evidence by the Railroad Commission?

A. Yes, I have seen them. They substantiate that to a great extent.

Q. Is there any real difference between the opinion of your engineer and the others as to the permeability and porosity and sand thickness of any general area in the East Texas field, any substantial difference?

A. I have never heard of any real difference.

Mr. Cottingham:

In that connection, how many permits have you asked for, Mr. Rowan, on this 25 acre tract?

A. On the 25 acres?

Questions by Mr. Cottingham:

Q. Yes.

A. I have asked if I would not be given an adjustment in allowable that I be given 20 additional wells. That would make twenty-five. That includes No. 6.

Q. That would make 25 wells?

A. Yes.

Q. You said that the sand thickness in this area you thought was 100 feet?

A. Yes.

752 Q. And then you said that the average was 42 feet?

A. 42, yes, sir.

Q. If the Commission has granted you 25 permits and you drilled to that density would that put you out of balance with the rest of the field at the present time?

A. At the present time taking the field as a whole?

Q. Yes.

A. Yes, sir.

Q. You have asked for more than you think you are entitled to?

A. No, sir, because they are still granting permits. They are still drilling wells over there. If the thing keeps on, I might have to drill more than 1 well to 1 acre.

Q. The basis of your testimony just given that you thought you had 100 feet of sand and that you thought there was a direct relation between the amount of sand thickness and the per acre foot to the amount that a well was entitled to—I believe you said that, didn't you?

A. Yes, I said that.

Q. If that is true, then you would have only a relation of 42 to 100, wouldn't you, under the present conditions?

A. I don't see how you could take that relationship in the drilling of holes.

Q. I am wondering—I have no opinion about it but I am just wondering if you had 100 feet of sand in this area and the whole field has 42 and you testified that the reason you didn't think you were permitted to get you fair share of the oil was because you had 100 feet and 753 you thought the whole field should be on a comparable basis.

A. I think that each lease should stand on its own feet. That average of 42 feet takes into consideration that on the west side there are wells producing oil from probably one or two feet of sand thickness, saturated sand thickness, and on the east side there are wells producing from one or two feet of sand thickness, and I think that the thickness of the sand under each lease should be taken into consideration, and that the lease should be given its fair share of the oil, the recoverable oil.

Questions by Mr. Stanberry:

Q. There is a lot about this I don't know. You say you have two feet of saturation on the west side and two feet of saturation on the east side or three or four feet. Are those two leases then entitled to the same amount of oil?

A. Using the basis of acre feet of saturated sand thickness only, they would be.

Q. How much longer will wells on the east side produce than wells on the west side?

A. They will probably produce fifty times as long, just guessing.

Mr. Tilley:

Q. You mean the extreme west and the extreme east, Mr. Stanberry?

Q. Yes, where you have four feet of saturation, say. The ones on the extreme east will probably produce about fifty times longer?

A. Yes.

Q. Is that a fair measure of the amount of oil that they are entitled to recover then?

A. No, sir.

754 Q. So it just doesn't work out all the time?

A. It will not work out if you use that factor alone. Maybe I should qualify that statement.

Questions by Mr. Tilley:

Q. Mr. Rowan, you don't mean to imply that it should be put strictly on a sand thickness basis, do you?

A. No.

Q. Mr. Cottingham has asked you some questions about—with reference to the number of wells you have applied for, Mr. Rowan. How many wells have you estimated it would take immediately, right now, to put you on a parity with the other wells in the field so as to permit you to produce the amount of oil daily which you think you are entitled to produce?

A. Right at the present time?

Q. Yes.

A. I think it would take six more wells.

Q. But you have applied for 20 additional wells?

A. Yes.

Q. You have been suffering a loss of oil here for some extent for some extended period of time, more than three years?

A. Yes, sir.

Q. This is the second time you have asked for this same relief?

A. Yes.

Q. You were here three years ago asking for the same relief, weren't you?

A. Yes.

755 Q. Did you get it?

No, sir.

Q. Did you have to go to Court?

A. Yes.

Q. What did the Commission do then?

A. About an hour before case was called for trial they granted the permits.

Q. You gave up your remedy for an adjustment of the allowable and took the permits?

A. Yes.

Q. Did that put you on a parity with the other wells in the field as far as an equal opportunity to produce the oil was concerned?

A. No, sir.

Q. Have you been losing oil since that time?

A. Yes.

Q. If you drill six wells, at the rate the Commission is granting additional permits, how long do you think you would be on an equal parity if you didn't have the other wells?

A. Not very long.

Q. Why?

A. Because as more wells are drilled and the density in the whole field becomes greater, I am losing my opportunity to produce oil.

Q. With the line of march that the Railroad Commission has created in granting permits since the discovery of the field, and assuming that curve will remain constant until the point is reached where it will be unprofitable to drill in the East Texas field would the granting of these additional permits by the Railroad Commission, if you were granted these six wells right now, would that inside of a year or two years put you right back where you are now?

A. I think it would put me back, yes, sir.

Q. In other words, what you would have then would be to invest about \$70,000 or whatever six wells would cost, and then you would be in the very same place you are now, wouldn't you?

A. Yes, sir.

Q. Then that isn't the relief you seek then, is it?

A. No, sir, that isn't.

Q. Why isn't it the relief you seek?

A. Because I think I have enough wells to properly drain my lease under proration and I think that I am entitled to recover my fair share of the oil without drilling any additional wells and without being put to that additional expense.

Q. You don't think you should be forced to spend your money to get the thing you are already entitled to?

A. No, sir.

Q. In other words, suffer confiscation in order to prevent confiscation?

A. That is right.

Q. Now, if you get six more wells or 20 more wells, unless the Railroad Commission holds down the permits of other operators in the field or adjusts the allowable, you are then in the same position two or three years from now that you are in now?

A. Yes, sir.

Q. Therefore that isn't an adequate remedy or relief for you?

A. No, sir, I don't think so.

Q. You are familiar with the East Texas field and the drilling program over there, aren't you, and the density of the wells throughout the field?

A. Yes, sir.

Q. Aren't there any number of wells over there where small tracts have less than your density, less than 5 acres?

A. Yes, sir.

Q. That condition exists throughout the field?

A. Yes, sir.

Q. On a large plan?

A. Yes, sir.

Q. Those wells are draining from the same reservoir you are draining from?

A. Yes, sir.

Q. It doesn't make any difference if they give you and your adjacent lease owners a certain allowable, unless it bears some relation to those other wells, then you are still being drained?

A. I think so.

Q. How many barrels a day have you estimated you should get a day under the present allowable of approximately what? 450,000 barrels?

A. I think using the reservoir acre foot of sand thickness that we should get 236 barrels a day.

Q. And using an allowable of about 500,000 barrels?

A. Yes, sir.

Mr. Cottingham:

How many per day?

758 A. 236.

Mr. Cottingham:

236 barrels daily?

A. Yes. 236 barrels per day on that 25 acre lease.

Mr. Cottingham:

And how much are you getting now?

A. I am getting a little better than 110 barrels a day now, Mr. Cottingham.

Q. How much would you get on a straight per well basis with your present number of wells?

A. A straight per well?

Q. Yes.

A. Without taking into consideration—

Q. If the East Texas field were on a per well basis how much would you be getting right now? On a 100% well basis.

A. I would be getting 101 barrels.

Q. If the old order stricken down by the Federal Court were in effect you would be getting 101 barrels and as it is now, you are getting 109?

A. I am getting 110. There would be 9 barrels difference.

Q. The East Texas field then is practically on a per well basis now?

A. Yes, sir.

Q. If there never had been any proration in the East Texas, would you have been—did you drill your wells in such time as you would have been permitted to get your fair share of the oil?

A. Yes, sir.

Q. You drilled your wells right in the early part of the life of the field?

A. Yes, sir.

Q. Did you drill them in accordance with the rules and regulations of the Railroad Commission with reference to the spacing of them?

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A. Yes, sir.

Q. When did Mr. Wood drill his well?

A. Not until about August, 1937.

Q. About six years later?

A. Yes, sir.

Q. If there had been no proration in East Texas there wouldn't have been any oil left under the Wood tract, would there be now? Not enough to justify drilling a well?

A. There might have been some oil but certainly under unrestricted flow—

Q. No reasonably prudent man or operator would have drilled a well there, would he?

A. I don't think so.

Q. The Railroad Commission has tied your hands for six years and then let Mr. Wood come in six years later and produce on a per well basis practically the same as you are producing?

A. Yes, sir, that is right.

Q. Was there anything to keep him from drilling that well?

A. Not that I know of.

Q. Did you ever hear Mr. Wood make any claim to that well until about eight months ago?

A. Not until just before he filed application for the permit.

Q. This four acre tract or practically four acre tract which he has filed suit against you on in Gregg County, the petition in which he entered in evidence at the last hearing, how long have you been in possession  
760 under your oil and gas lease including that tract and producing oil from it?

A. Better than six years.

Q. You have been paying taxes on it?

A. Yes, sir.

Q. And have been in possession of it?

A. Yes, sir.

Q. Has anybody ever made any claim to that tract until about six or eight months ago?

A. No.

Q. Did Mr. Wood ever come to you and say that was his tract?

A. No, sir.

Q. Did you ever see him on it?

A. No.

Q. Did any of your men ever hear of him coming over there?

A. No, sir.

Q. How long have the Todds or their ancestors been in possession of this 4 acre tract filed suit on under fence and paying taxes on it over there?

A. There are affidavits from old people in the neighborhood showing that he has been in possession of the land for fifty years.

Q. Have you talked to Mr. Todd about this case?

A. No, sir, I haven't talked to him.

Q. You haven't talked to him about that boundary dispute?

A. Not personally.

Q. Now, Mr. Rowan, even if you were on a strict potential basis of a well alone, what would you be getting a day?

A. Based on 500,000 barrels a day allowable I would be getting about 160 barrels.

Q. That shows that your potential is substantially better than the average in the field?

A. Yes, sir.

Questions by Mr. Stanberry:

Q. What relationship is there between potential and the amount of oil under your lease?

A. I don't think there is a whole lot, except that potential indicates to a certain extent the recoverable amount of oil. It indicates the permeability and you have to have permeability in order to get the oil out.

Q. Is there any relationship between the potential and the amount of oil in place under a lease?

A. No, no direct relationship, I don't think.

Q. Then you think that potential is the thing which should be given very much consideration in fixing allowable under a lease?

A. I think it should be given consideration.

Q. How much?

A. I don't know. That is an engineering problem. I don't know. I think it should be given some consideration. It indicates permeability and without permeability you can't get the oil out even if it is in the reservoir.

Q. Doesn't permeability indicate more the rapidity with which you can recover it than the amount of the oil to be recovered?

A. It indicates rapidity.

Q. Does it have any relationship or much relationship to the amount to be recovered where you have a water drive?

A. No. I don't think it does.

Q. It just indicates the rapidity with which  
762 you can recover it?

A. Yes, and of course with a highly permeable sand you will get a greater per cent of the oil in the reservoir out than in a tight sand or less permeable sand.

Q. If you have a low permeability sand and have a water drive like in East Texas and you withdraw it slowly, don't you recover about as much as if the sand were permeable?

A. I believe you would under a low rate of recovery. I believe you would get it.

Questions by Mr. Tilley:

Q. I didn't understand the question asked in relation to the bearing that potential has. What was your answer?

A. I said that potential had a relation to permeability but that it doesn't necessarily indicate the reservoir content of the oil under a lease.

Q. Does potential have any relationship to water drive or gas in solution?

A. It has a relation to pressure. Water drive is pressure.

Q: Then if you are favorably situated by virtue of the pressure which you have and reservoir energy, then that is represented in the potential?

A. Yes, sir.

Q. And permeability is represented in the potential?

A. Yes, sir.

Q. If you even take potential alone—you are using the potential that is used by the Railroad Commission?

A. Yes.

Q. If you take potential alone then you are suffering confiscation now because if you take it alone and put it on a well basis you would have 160 barrels per day under the present allowable?

Mr. Rauhut:

For the lease or per well?

A. Per lease.

Mr. Stanberry:

He said that potential had very little relation to the amount of recoverable oil under your lease.

Q. That is what I want to clarify. I don't think he meant that. It has some bearing, of course.

A. I didn't say the amount of recoverable oil. It isn't a measure of the amount of oil under your lease in place. But it does have a relationship to the amount of recoverable oil.

Mr. Stanberry:

Didn't you testify that if you had a water drive and made your withdrawals slowly you would get about the same per cent of withdrawals assuming the same porosity

for the sand in one that was not permeable as one which was permeable?

A. I said I believed you would.

Q. You said, I believe, that you had a water drive—if you had a water drive, that wouldn't vary your potential very much, didn't you? Whether you had a tight sand or a loose sand?

A. No, I didn't say that.

Q. What did you say?

Mr. Stanberry:

He said it wouldn't affect the ultimate recovery much.

A. I said under a very slow rate of withdrawal the sand—you might get all your oil out of your reservoir even though this lease over here didn't have the permeability that this lease over there had because your water  
764 drive would have a tendency to force it out under a very slow rate of withdrawal.

Q. You mean an even and uniform rate of withdrawal?

A. Yes.

Mr. Cottingham:

Do you believe that slow rates of with..... from the common reservoir where you have an active water drive will ultimately result in more production?

A. Yes, sir.

Mr. Cottingham:

You stated that under the potential factor if that was the only factor you would be entitled to 160 barrels?

A. Yes.

Mr. Cottingham:

If the potential of the Wood well is equal to the average potential of your wells, under potential what would he get?

A. He would get the same allowable as mine with the potential factor only.

Mr. Cottingham:

How many barrels would that be.

A. It would be 5 into 160; 32 barrels.

Mr. Cottingham:

On a strictly potential basis there would be discrimination as against your lease?

A. Yes. That is correct.

Q. Then under potential alone you are being discriminated against to the extent of about 50 barrels a day on that one lease and considering acre sand feet thickness—acre feet of sand thickness—alone, which you don't suggest, you would be suffering a discrimination of about 126 barrels a day?

A. That is correct.

Q. And under a combination of the two, whatever that combination might be, you would be suffering a greater discrimination than you would be under the straight potential basis?

A. Yes, sir, I think there is more than one factor which should be used in any proration order in East Texas.

Q. Have you ever heard any engineers argue—

Questions by Mr. Stanberry:

Q. Ask him what all the factors are which should be considered. You said you thought more than one factor should be considered. How many factors do you think should be considered?

A. I think that acre feet of sand thickness is a very important factor because it tells you what—it gives the amount of oil in place under each lease and I think that potential is another factor which should be considered

because it indicates the rapidity with which that oil could be taken out while the permeability which would be similar to open flow conditions—

Q. You think if you had a lease and I had a lease beside it and assuming the same porosity and the same sand thickness, because your well happened to be in a more permeable formation than mine, do you think you are entitled to a bigger withdrawal than I am?

A. I do.

Q. Why?

A. Because under open flow conditions I would get more oil. If you would take the restraining hand off of me and the government washed its hands of proration and there weren't any laws on it and let me go ahead and drill my wells and produce my oil as we used to do, I think that I would get more oil than that neighbor.

Q. If you take the policeman off the beat, I  
766 could go to the bank and get more money than I can now. But as an equitable matter assuming we have the same amount of oil under my lease and just because your lease happens to be a little better than mine or your wells happened to be deeper than mine and take in more sand, if we drilled under better field practice than you did, do you think that you should have a bigger allowable than I should have because you drilled your wells wrong than I do because I drilled mine right?

A. Yes, I think you should give the advantage to experience in the oil business just like you should any experience in any other line of commercial activity.

Q. If I drilled mine right and you drilled yours wrong, don't you think that potential as a proration factor and especially in a producing horizon with water underlying it like in Conroe and anywhere in the Gulf Coast where you drill as much of your sand as you can to get as big a potential as you can—don't you think that is bad field practice?

A. Yes, to drill that amount of sand and take an open flow potential. I think it is bad practice.

Q. But in your potential plan you would reward a man for bad field practice, because he drilled more of the sand and got a bigger potential?

A. Not necessarily.

Q. If you take potential as a proration factor you would.

A. Evidently the Railroad Commission doesn't think that because they use a 100% potential factor in East Texas. The questions you are asking would indicate that the Commission is making a very serious mistake in using the potential factor because they aren't even taking the potential under restricted flow but under wide open flow.

Q. I am asking you if you don't think you would make a mistake—

A. I don't think they would make a mistake in East Texas. I think it would be a very serious mistake to open wells on the west wide open because oil would be trapped in place which would never be recovered.

Q. If you have two wells in identically the same formation and say I drilled in 20 feet of sand and you drilled 80 feet of sand, and you got a considerably bigger potential than I did just because you drilled your well deeper, do you think that you are entitled to a bigger daily allowable than I am?

A. What is to keep you from drilling your wells on down?

Q. Because I wouldn't want to drill closer to the water and take that chance on it.

A. I think that experience in the oil business and management should be rewarded. In my own case over there we have a well west of us that is taking in 100 feet of sand, 100 feet of productive formation. We have a well south of us which is taking in 90 feet and I have just testified I only took in 60 feet.

Q. I think your wells are finished the best.

A. Notwithstanding that fact, I was willing to take the potential of my well and let the Railroad Commission use it as a key well. While it isn't the biggest in the field, it is a good well with 60 feet of sand.

Q. Do you think your well is finished in better shape than those drilled to 100?

A. If I didn't, I would drill deeper.

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Q. Just because he drilled nearly twice as much sand as you did, do you think he should be entitled to twice the allowable?

A. I don't think you should put a reward on drilling deeper to get a bigger allowable.

#### Questions By Mr. Cottingham:

Q. As to sand thickness, you said you thought sand thickness should be one of the factors in the East Texas field?

A. Yes.

Q. Where do you get the water drive in the East Texas field?

A. It used to be around minus 3300 feet. I don't know what it is now.

Q. It used to be 3320 minus 3320.

A. I believe that is correct.

Q. It was 3320 feet below sea level?

A. Yes.

Q. The general practice since there were a few wells in the field on the west side—what has been the general practice with reference to penetrating sand on the west side?

A. I think the general practice has been to stay above that water level.

Q. How far?

A. As far above it as they could possibly stay in order to get an amount of sand so that the well would produce

by flowing methods, taking in just as little sand as possible on the west side.

Q. Do you know—would you calculate the sand thickness in those areas for the factor?

A. Yes.

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Q. How would you go about doing it?

A. I would go about doing it by calculating the water table and taking the distance between the top of the sand and the top of the water table.

Q. Would you assume all that section you estimated was saturated or would you assume that 20% or 40% or 50% or 100% was saturated? How would you calculate it?

A. I think the Railroad Commission should have an engineering force that is capable of calculating it. You can run permeability tests and tell where the shale is. That is, a Schlumberger test.

Q. You can't run a Schlumberger on a well that isn't drilled.

A. But you can run them on the wells that are drilled and tell where the water comes in and where the shale is. In the absence of any information to the contrary I would certainly assume that that sand was saturated.

Q. The entire section of the Woodbine sand?

A. Yes, sir.

Q. In your calculation of 60 feet did you assume all 60 feet was saturated?

A. Yes, I put it all in the same category.

Q. Do you know the character of the Woodbine formation? Is it made up of all sand?

A. No, sir.

Q. But you applied all saturation to it.

A. The shale content isn't uniform and I would say that if you took the top of the sand as the basis and the base of the sand and used that as the sand thickness, I would say over the entire area of the field you would be doing substantial justice to all leases

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because the amount of shale in the sand will run just about uniform over all the entire field.

Q. Is there any other content other than sand and shale in the Woodbine?

A. There is some ash.

Q. Does it carry oil?

A. I don't know whether it does or not. I have heard it does carry some oil.

Q. What is the thickest continuous ash deposit you have encountered in the Woodbine section?

A. I don't know offhand. I know we drilled and cored some ash.

Q. What is the thickest shale section you have drilled?

A. I would say two or three feet.

Mr. Stanberry:

Is that solid ash or just streaks of ash through shale?

A. I think it is solid. It comes in layers.

Q. You think it is continuous throughout the field?

A. No, sir.

Q. Is it lensing?

A. Yes.

Q. If you pick up volcanic ash and shale in one well, does it necessarily follow you will pick it up in the offset well?

A. Not necessarily. Mr. Cottingham, no, sir. But I think that any order you used would give substantial equity. If you assume that all the sand was saturated, I think you would be doing substantial equity between the lease owners. I am not going to say—

771 Q. Would you trade acre foot for acre foot of your lease with some in the south end?

A. No.

Q. Why?

A. Because my pressures are higher.

Q. In the beginning of the field, in the early history of the field, would you have traded with the pressures the same?

A. I don't know, Mr. Cottingham. We didn't do much work in the south end of the field. I haven't drilled very many wells further south than the London townsite area and I don't know the conditions down there very well.

Q. If you go purely on pressure would you rather have a per acre sand foot over next to the water line or where you are now?

A. Acre foot? I would rather have them where I am now.

Q. Why?

A. Because I will get more recovery.

Q. You think over in the fairway, as indicated in your petition it will yield more oil than over on the west side?

A. Yes, sir.

Q. Per acre foot?

A. Per acre foot?

Q. Yes.

A. No, I doubt that. Per acre foot I assume they would probably be the same.

Q. Assuming that porosity and permeability are the same?

A. Yes.

772 Q. Don't you have a comparable condition of permeability from east to west in the East Texas field?

A. I think you have probably a higher permeability maybe in the middle of the field or the middle east part of the field than you do on the west or on the east.

Q. Is the permeability better at the north end of the field than in the south end generally?

A. You mean the extreme south and extreme north?

Q. Yes.

A. I don't think so. I think it is about the same.

Q. You think close to Joinerville and where your lease is on the north end are about the same?

A. No, my lease isn't in the extreme north end. I am talking about Upshur County. Comparing Upshur County with Joinerville I would say they are about the same.

Q. Are you north of the river?

A. Yes, it's north of the river. If you take leases right at the London area and opposite Kilgore in the fairway probably conditions are very comparable.

Q. Have you drilled any wells on the east margin of the field?

A. Yes, sir.

Q. What about the conditions of the field over there? Is it as good per acre foot as in the fairway?

A. No, it has a tendency to get shaly and finally goes into shale and pinches out.

Q. Per acre foot you would rather have your stuff where it is?

A. Yes, I bought it that way on purpose and paid the price for it.

Q. But it wouldn't be just an ideal yard stick to put on the field?

A. It wouldn't be a perfect yard stick and I  
773 don't think the Commission can get a perfect yard stick but I think you could have a yard stick which would do substantially more justice than the one you have now.

Q. What yardstick do you propose that the Commission follow?

A. I haven't suggested any. I think that the Railroad Commission, if they want to do equity, could find equity very easily.

Mr. Tilley:

They do it in other fields, don't they?

A. Yes.

Q. I think the Commission is anxious at all times to get the best information it possibly can about that.

A. I think they have information now, and they have refused heretofore—we made application three or four years ago that other factors should be considered besides potential alone, and the Commission has refused to consider any other factor but potential. I have the same feeling about taking the potentials on the west side of the field that the Examiner has. That to take wide open flow potentials is liable to cause coning of the water and trapping of oil which would never be recovered in the field and cause subsequent waste in that field.

Questions by Mr. Stanberry:

Q. This is more trying to arrive at the facts than a formal hearing. Do you believe that uniform withdrawals are good for a field?

A. What do you mean by uniform withdrawals?

Q. To withdraw from each area as nearly uniformly as you can so that the water level will rise uniformly, reducing the pressure uniformly and taking withdrawals uniformly.

A. I think that pressure should be maintained  
774 to the maximum and that the water level should be kept as nearly constant on a horizontal plane as possible.

Q. The only way you could do that is by uniform withdrawals, isn't it?

A. Not necessarily, no. In talking specifically about the East Texas field the middle of the field has a greater sand thickness than the east and west sides.

Q. The water level is the same?

A. Yes, sir. Consequently you can take out of the middle of the field greater amounts of oil than on the east and west sides, the reason being that you are draining a greater thickness of sand.

Q. If you take ten times as much out of 100 feet of sand as you do out of 10 feet of sand, would your water level remain constant?

A. I think it would.

Mr. Cottingham:

Let me ask this following that question. You said you thought it would; where the said thickness is 20 feet and you penetrated 15 feet sand and you are five feet above the water level and over here you have 50 feet of sand, and you penetrate 45 feet and are 5 feet above the bottom, if you take 2<sup>1</sup>/<sub>2</sub> times as much oil from it around the bore of that well that has 50 feet of sand than you do from this other well, are you apt to have water coning?

A. I don't think so. I think that the migration of oil is more horizontal than it is vertical.

775. — Mr. Cottingham:

Which direction does the water table pressure exert itself against the oil volume?

A. Vertically.

Mr. Cottingham:

That's all.

Q. Is your lease better than the adjacent leases to it?

A. No, sir.

Q. How far do you think that a well will drain in the East Texas field?

A. I think you could put a well in the middle of the Gladewater nose, where my lease is, without any wells within ten thousand acres and I think that you could produce that well to such an extent that drainage would be felt all over that ten thousand acres before water would come in.

Q. How big an area around your lease, and how far out would you have to go before you wouldn't find the

density just about the same as it is on your lease? What is the closest place to your lease where it is drilled denser than your lease?

A. Right north of us.

Q. How far?

A. I would say 1500 or 2000 feet.

Q. How far to the east of you?

A. That is northwest. To the northeast it would be 1500 or 2000 feet.

Q. And how far southwest?

A. I don't know. There are some small tracts down there around Lake Divernia.

Q. If you go due south how far would it be?

A. I don't know.

Q. How about to the east?

A. About half a mile.

776 Q. If you take a circle all the way around your lease a mile square around it would the density be more than your lease is or not?

A. It would be—there would be certain tracts where it would be greater.

Q. I am talking not about tracts but about the area as a whole.

A. I think it would probably be somewhere about the same.

Q. Then for a mile in each direction from you would the density be about the same as yours?

A. I think it would be. I am not capable of testifying accurately whether it would be or not.

Q. But it would be approximately?

A. Yes, sir.

Q. The allowable is about the same.

Mr. Tilley:

Are you testifying?

Q. No, I'm asking questions. Assuming that that is true and that for a mile around your lease the density is about the same and that the allowable is about the same, then are you suffering any material drainage?

A. I am.

Q. How?

A. We have, according to my idea of the ownership of our lease over there—we have a definite interest in the oil which we own in place, and in addition to that we have a definite interest in the reservoir pressure, and we have the right to utilize our percentage of it and it doesn't make any difference whether that energy is being utilized a half a mile away or not. If we are losing it, 777 then we are losing something we had originally.

Q. How much longer would your lease produce than the leases on the west side?

A. I don't know. That depends on what the Railroad Commission does and we couldn't forecast that.

Q. Which will produce the longest?

A. If we get equity, ours will produce substantially longer.

Q. Will your wells produce longer and in greater amounts than the wells over in the thin section on the East side?

A. Mr. Stanberry, if you give me my equitable proportion of the oil which I own now and let me utilize my portion of the reservoir energy, I will get my oil and the boys on the east will get theirs but I will get a lot more oil than they get and their leases will be producing longer than ours will but they won't be producing the amount of oil they are producing now.

Q. Will you not in the long run get more oil than they will anyway?

A. Than the boys on the east? You mean under your present system of proration?

Q. Yes.

A. No.

Q. In the long run?

A. No. You are talking about the boys on the east?

Q. Yes.

A. No.

Q. How about the ones on the west.

A. Yes. I bought more oil than they did. I could have  
778 bought leases near Gladewater or other places. I paid the price for mine to get in the middle of the fairway as I knew what the sand thickness was.

Q. You think that the Commission should attempt to adjust your allowable to where each man will get the oil which he had in place under his lease originally?

A. Originally?

Q. Yes.

A. Not now, no.

Q. You think that—

A. I think that is what they should have done in the beginning.

Q. Then say that a man—that this is a common reservoir and that you drilled your lease six years before Mr. Burke drilled his. In order for each man to get the oil originally under his lease how would you adjust the allowable where a man was delayed in beginning?

A. I didn't say I wouldn't adjust the allowable. If a man just sat down idly and let somebody else take the oil away, that is his hard luck.

Q. Maybe he didn't have as much money as you did.

A. That isn't my hard luck.

Q. There are difficulties in trying to adjust the allowable on any basis so that each man will get every pint or barrel of oil he had under his lease, aren't there?

A. Yes.

Q. It is a difficult proposition?

A. Yes.

Q. And if you take only the acre feet of sand  
779 basis there is no way in which you can fix the  
thing to where four acre feet of sand on the  
west side will produce as much oil as four acre feet of  
sand of the same kind on the east side.

A. Yes, sir, I think there is.

Q. How?

A. That is the reason I said that potential was a factor.  
If you don't want to use potential, there are other  
factors which could probably be substituted for it. I think  
that the wells on the west side have a much higher  
potential than the wells on the east side; consequently  
their allowable would be higher and they would get a sub-  
stantial amount of oil and wells producing from the east  
side would be restricted to where they would get their  
amount of oil but it would take them longer to get it out.

Mr. Tilley:

It doesn't make any difference whether you say you are  
entitled to the oil and gas under your lease or are entitled  
to the equal opportunity to produce your fair share of the  
oil in that reservoir or whether, since you are going to  
apply proration and restrict the production, that you are  
entitled to be curtailed according to the relative rights  
which you had before proration—under any of those propo-  
sitions, if you apply any of them to this case you are  
suffering confiscation?

A. That is right.

Mr. Tilley:

Mr. Stanberry has brought out that maybe within a mile  
or two there weren't many leases drilled to a greater  
density than your lease. But suppose just a mile away  
there was a greater number of leases which were  
780 drilled to a greater density than the ones a mile  
from you. Wouldn't that necessarily mean that  
those wells would draw from the area within a mile from

you and therefore the area a mile from you would draw from you. Therefore you would set up drainage circles throughout that field and eventually if you get a very densely drilled area anywhere in the East Texas field, it is going to take that group of operators and give that group of operators an advantage which if it keeps on going over will eventually reach you and therefore take your oil. Is that right?

A. That is correct.

(Mr. Stanberry):

Q. Mr. Rowan, what is the average density of the field?

A. I think that it is about 1 well to 5 acres?

Q. So we can just forget a mile around it and take for twenty miles around you and the average density would be the same as yours is.

A. Just about the same.

Q. If you are going to take the reservoir as a whole and you are drilled to the average density, then where are you being hurt?

A. I am being hurt by virtue of my position on the structure and the thickness of the sand and my greater reservoir. I bought more oil and paid for more oil and if you didn't—

Q. Won't you ultimately produce more oil any way?

A. No.

Q. You will produce longer than most of the leases.

A. Yes, I will produce longer than the leases on the west of mine.

Q. You will produce more than the leases on the east of you; won't you?

A. I think under the present system they will produce more oil than I will. There are a good many sub-marginal wells—

Q. Those sub-marginal wells on the east side which are now pumping—they are pumping now?

A. You mean less than 20 barrels.

Q. Yes.

A. I don't know.

Mr. Cottingham:

That is what I wanted to ask. Where are the sub-marginal wells in this field?

A. On the east side.

Mr. Stanberry:

So that ultimately you could get more oil by reason of your position on the structure than on the west or east?

A. Yes.

Mr. Cottingham:

Are there any sub-marginal wells on the west side?

Questions by Mr. Cottingham:

A. I don't think so.

Q. Are there any sub-marginal wells on the south side?

A. There are not.

Q. Wouldn't that be a flag to tell you where the first wells are going out of the picture? If you knew that?

A. That is the position which we have on the structure which we bought and paid for.

Q. If we knew the condition showing that some of the wells can't make their allowable on the west side and on the east side and we don't have any in the fairway that aren't making more than their marginal allowance, wouldn't that indicate that that shows that the fairway will produce much longer than the others?

A. The difference in the amount of production of any well as compared with the fairway is so small and if that condition continues to exist over a period of years, and I don't think anybody has any reason to believe that it will cease to exist unless the Railroad Commission does

something about it, then there will be substantial drainage from the fairway into the east portion of the field and there will be substantial drainage from the sparsely drilled areas to the densely drilled areas.

Q. Under the present rate?

A. Under the present plan of proration in East Texas.

Questions by Mr. Stanberry:

Q. If you are drilled to the average density of the field and as long as you are drilled to the average density of the field, then from the density standpoint you are not suffering?

A. From the density standpoint, no. I haven't complained about suffering from a density standpoint. I complain of the oil that is being confiscated and I am not being given an opportunity to produce the amount I am entitled to.

Q. If you aren't complaining as to the density of drilling—you say you are not complaining as to the density of drilling. You base your complaint on the sand thickness?

A. I base it on the method of allocating the allowable. I think Mr. Tilley stated that fully in the opening remarks.

Q. While Mr. Tilley stated it fully, we had quite a big of conversation about a .1 of an acre lease and how much it was getting and how little you were getting.

783 I am talking about averages. From the average of the field you are not suffering.

A. I am suffering. Certainly I'm suffering.

Q. On the average density?

A. Not on average density, but I am losing oil every day.

Q. From the standpoint of density. He may be getting more than he is entitled to.

A. There are a lot of wells getting more than they are entitled to and I am getting substantially less than I am entitled to.

Q. I won't argue that question with you. From the standpoint of acreage allocated to the wells I won't say he isn't getting more than he is entitled to—

A. If you want that question put in the record that I am drilled to the average density of the field, I will say yes.

Q. You aren't suffering from that feature?

A. I am not suffering from that feature but I'm still losing oil. I would like to say this, that if there was no proration and if I were left to my own judgment as to the drilling of those wells and we were on wide open flow the west side of the field would go to water quickly and the east side of the field would go to pumping and the middle of the field would be flowing, actually flowing, long after the east side had gone to pumping and was pumping small quantities of oil and the west side was plugged.

Q. It is doing that now, isn't it?

A. I would be losing the advantage I bought and purchased by buying in the fairway.

Q. It is doing that now, isn't it?

A. It is doing it to such an infinitesimal quantity; over a period of twenty years I will lose substantial quantities of my oil from under my lease.

#### Questions by Mr. Tilley:

Q. Mr. Rowan, according to your testimony density isn't the situation that is hurting you unless you apply the rule of proration which you are now applying; is that correct?

A. That is correct.

Q. Then it is hurting you?

A. That is correct.

Q. If you reduce the allowable of those wells to what they should be, then you wouldn't be hurt?

A. If they would adjust the allowables, that is correct.

Q. But if you let a man on one acre drill five wells and give him the same allowable that they give you when he has 1/20th as much oil as you have, then the density is hurting you, isn't it?

A. Yes, sir.

Q. Let me ask this question. If you had one well in the fairway on your lease and a man on the extreme east edge had one well on 20 acres on the east edge, wouldn't he eventually under proration produce substantially, a great deal substantially more oil, than you would? According to the amount of oil under the lease?

A. I didn't get the question.

Q. You are in the fairway and the Railroad Commission says you can't produce but twenty barrels a day on your 20 acres in the fairway but on the extreme east edge they said that another man with 20 acres could produce 20 barrels on his 20 acres on the eastern edge.

Eventually that will be the relation of the ultimate recovery of your well as compared to that lease in reference to the oil that underlaid it originally?

A. Mine would be substantially less. His would be substantially greater.

Q. That is the effect now under the present proration order, isn't it? It gives that marginal well on the east side that can produce only 20 barrels as much—it gives that well that can produce only 20 barrels a day, it gives them the same amount of oil within two barrels as you are given with an hourly potential of 964 barrels?

A. That is correct.

Mr. Cottingham:

Mr. Rowan, do you think that the marginal well statute should protect a well on 1 of an acre as much as a well on 5 acres?

A. I don't think so.

Mr. Cottingham:

You don't agree with the law, the marginal well statute?

A. No, sir, I don't. I think that we have certain property rights set up in our Constitution which should be inviolate. I don't think that just because a man has .1 of an acre, I don't think you should give that man an advantage to produce oil which doesn't belong to him. I don't think so.

Questions by Mr. Stanberry:

Q. You don't believe in redistribution of wealth then?

A. No. I think if I have a marginal farm and it will not produce enough wheat or corn or cotton to pay for the seed, then I think I would be a darn fool to  
786 plant it and I think that a man who doesn't have a substantial amount of oil is a darn fool to drill a well when he knows the ultimate production from it will not pay for it.

Q. If they took the restrictions off of you, wouldn't Mr. Wood take you to the same kind of cleaning, only worse?

A. No.

Q. Why?

A. Because I would drill so many wells around him I would burn him up.

Q. You would be just pulling in from every direction to your wells.

A. Yes, and I would burn him up and every operator around there would.

Mr. Tilley:

Mr. Wood wouldn't be there, would he?

A. No.

Q. He would get more oil than he had under his .1 of an acre whatever you do.

A. Yes, but he wouldn't have the advantage he has now.

Q. He could get more in a day that he has under it.

A. He might or he might not.

Q. What is the potential of his well?

A. If Mr. Wood waited six years under open flow conditions to drill a well on the .1 of an acre, he wouldn't find it profitable to drill that well and pump it.

Q. But talking about conditions as we find them now, if you could take the restrictions off, couldn't he in a day run more oil than he ever had under his lease?

A. He could if we sat by and didn't drill, but if we drilled 1 well to .1 of an acre, there would be  
787 twenty rigs around him and all twenty would be pulling the same as he would.

Q. But they would be pulling more from outlying area into that area.

A. I assume, Mr. Stanberry, that drainage is in a circle that your drainage area will be like this and that the operators, the other operators, would make the same effort to protect their land from drainage which I would and his well being in the center—

Q. If you had a well drilled every 50 feet from him to the north, east, south, west, northeast, northwest, southeast, and so on, if you had eight wells drilled around him within 40 or 50 feet of each other don't you think any oil would pass those wells and go to that well when you create that low pressure area?

A. No, sir.

Q. You don't think so?

A. No, I don't. I have operated in a good many fields under open flow conditions and I have never seen that condition exist.

Q. You are the first man I ever saw that thought that oil drained each way so far and then turned around and went back.

A. I suppose that the other operators are like I am and would protect their interests.

Q. If you created a low pressure area and have five wells around there you don't think that any oil will pass those four on the outside and get to his?

A. I think that the drainage is just as likely to be in this direction and this direction as it is to be over here and I think that your drainage is likely to be this way. Assuming that—

Q. It is just as likely to be this way?

788 A. The circle would be like that.

Q. It would drain past those wells, wouldn't it? Don't you think wells will drain past each other?

A. It depends on how you produce them? If you shut one in, it would.

Q. If you produce them wide open or under restricted flow or any way.

A. No, I don't think so.

Questions by Mr. Cottingham:

Q. Have you any information as to whether the vertical permeability and the horizontal permeability of the Woodbine section is the same or different?

A. I would be inclined to think offhand that the horizontal permeability would probably be greater.

Q. Have you any data on the comparison of the permeability along the longitudinal section? Is it greater along the fairway than on the east and west sides on the horizontal plane?

A. I believe it is greater—you are talking about the field?

Q. I am talking about field drainage, over-all drainage.

A. I believe it is probably greater in the fairway.

Q. That is all.

Mr. Stanberry:

It is after twelve. We will recess until 1:30.

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Mr. Stanberry:

Proceed with your witness.

Questions by Mr. Tilley:

Q. Mr. Rowan, of course you said you bought this acreage over there and bought it on an oil content basis on its position on the structure.

A. Yes.

Q. You have paid taxes on it, haven't you?

A. Yes.

Q. The State of Texas taxes your oil on the oil content and the oil in place and gas in place; isn't that right?

A. Yes.

Q. And they also tax the east and west sides the same way?

A. Yes, sir.

Q. On the ownership of the oil and gas in place. Yet you are a producer and the State turns around and lets you produce on practically a per well basis?

A. Yes.

Q. One well on 10 acres gets as much as 1 well on 1 acre.

A. Yes, sir.

Q. With a small variation in the potential?

A. Yes, sir.

Q. Mr. Cottingham has asked you certain questions the effect of which would indicate that the sand conditions over there aren't uniform. I will ask you whether or not they are fairly uniform?

A. In my opinion they are fairly uniform.

Q. Is that generally conceded by most of the engineers?

A. I think so.

Q. Evidence was introduced almost uncontroverted in the Federal Court in Houston as to that?

A. Yes.

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Q. And the Railroad Commission was a party to that?

A. Yes.

Q. And the Railroad Commission didn't take issue with it?

A. I don't think so.

Q. Of course, Mr. Rowan, we know that no man can conceive of a perfect proration anywhere but if a plan of proration was conceived in East Texas which gave effect to potential and acre sand feet, could adjustments be made if there were any variations in the formation of variations in the sand thickness in any particular area?

A. Yes, sir, I think that adjustments could be made.

Q. If the Railroad Commission were able to determine—

Mr. Stanberry:

From the engineering standpoint or the legal standpoint?

A. From a practical standpoint.

Mr. Stanberry:

You don't know whether it would be legal or not?

A. I think it would be legal. I think the Railroad Commission could make the same adjustments to take care of any inequities that might take place in any given order under a plan of proration which considered the acre feet of sand thickness and potential or any other factors the same as they do now, under the potential method of allocating the allowable production of wells. Each operator could make complaint and adjustments could be made.

Q. Don't you think that engineers, the Railroad Commission's engineers who are very competent—  
791 don't you think that they could with more definiteness determine the sand thickness throughout the field than they have been able to tell the potential of the various areas?

A. Yes, sir, I think they could. I think that there is more information available as to the sand thickness and content of the sand and porosity and permeability of the

sand than there is as to the potential ability of each and every well in the field to produce.

Q. The present plan is based on potential, isn't it?

A. It is based on average potential only. They use something like 300 wells and draw theoretical contours which indicate the ability of the probably 24,000 or 24,500 wells to produce.

Q. And then make adjustments in cases where the potential—would the variations in the sand there under be demonstrated by the potential?

A. Not altogether.

Q. To a large extent would it? To some extent isn't it?

A. You mean the condition of the sand?

Q. I mean if there were variations. If one well was drilled into shale or there was a shale formation in the sand area around that particular well, wouldn't that be reflected in any way by the potential of that well?

A. To a very limited extent I would say that the thickness of the sand is indicated by the potential of the well.

Mr. Stanberry:

The potential of the sand and the depth to which they drilled into it would affect it.

A. Yes.

792 Mr. Stanberry:

But the potential alone wouldn't reflect the sand thickness?

A. No, sir.

Q. You have seen these sand contour maps of the Railroad Commission by their engineers, haven't you, which have been used by the Railroad Commission?

A. Yes.

Q. Do those maps show the sand conditions fairly uniform?

A. They indicate the thickness of the sand.

Q. Do they show it is uniform and remains constant? Of course there is a variation on the east and west but do those maps show it fairly uniform in such a way that an engineer—

A. What do you mean by uniform? That it has the same thickness all over the area?

Q. Only as to depth and thickness.

A. They indicate definitely that the saturated portion of the sand goes from nothing on the west to its greatest depth in the middle of the field and tapers off to nothing on the east.

Q. If they use that as a factor in determining the oil reserve and there is a variation of any kind that could be determined, couldn't it?

A. It could be determined very easily. I think you could draw a cross section of the field and put the field in squares of 640 acres which would be less than 200 squares and I think that if necessary to get information the operators in the field would drill test wells which would penetrate clear through the sand even though the test wells had to be plugged later on. Those test wells could be cored and indicate exactly the sand  
793 content and Schlumberger surveys could be made which would give a further check against the core record and a very definite knowledge of the thickness of the sand and the saturation and the porosity could be determined. It could be determined to a fairly accurate extent right now from the information they have from the wells now.

Questions by Mr. Cottingham:

Q. Are you speaking from any tests you have made yourself or just speaking from the general information which you have acquired from the practical standpoint?

A. I am speaking from tests I have made and from general information which I have acquired.

Q. Do you know of any wells where the offset well contains half the amount of actual saturation with reference to an offset well? Have you cored any cases like that?

A. That might be true on the east side of the field but I don't know of any from my own knowledge. I think that the information that you have now which you make the sand contour maps on would be definitely more accurate than the information which you are using right now on potentials. I think the conclusions which you are drawing from potentials right now are very very inaccurate.

Mr. Stanberry:

Your idea is to make sand contours the basis—

Q. What the geologists and engineers call the isopach method of getting the thickness of the sand?

A. Yes.

Q. In the early history of the field the water level was practically level and everybody agreed it  
794 was practically minus 3320?

A. I think that is correct.

Q. Has the water table maintained that level condition during the field since 1,200,000,000 barrels of oil has flowed from the field?

A. I am of the opinion it has risen some.

Q. Where has it risen the most?

A. I don't know.

Questions by Mr. Tilley:

Q. Mr. Rowan, we were talking this morning about uniform withdrawals. I will ask whether or not the withdrawals that have been allowed by the Commission have not been different, that is, with the weighted potentials used one well has been given a substantially higher allowable than another well. Would that keep the water

level just about the same or would that cause water coning? What was the effect of the Railroad Commission having given one well a better allowable than another?

A. I don't understand the question.

Q. It was intimated this morning that if the Commission went ahead and adjusted the allowable for these wells and you had a high—withdrawal from one lease than from another lease or a higher withdrawal from one part of the field than from another part that the water level wouldn't rise evenly and unequal withdrawals might cause premature water encroachment or one thing or another—

A. I don't think that was intimated or I didn't hear it. I didn't understand it.

Q. You do know when this order was first promulgated taking into consideration potentials that one well  
795 in the field was allowed substantially more than another well in the field, don't you?

A. Well, I wouldn't want to say substantially but it was allowed to take more.

Q. The difference between the worse marginal well in the field and the best well in the field was enough that that same margin if given you now would substantially relieve you, wouldn't it?

A. Yes, sir.

Q. The Railroad Commission has tolerated that condition for some time?

A. Yes, sir.

Q. Has the Railroad Commission in other fields been able to determine factors the result of which when applied to the proration order would give equity to the operator who has more acreage than another operator?

A. I think that acreage has been a factor in a good many fields.

Q. Do you know of any reason why those fields—the underground conditions in those fields is such that the same order could not be made applicable in this field?

A. No, sir, I don't know of any reason why.

Mr. Cottingham:

Have you any specific fields in mind which you could compare with East Texas?

A. No, I don't have any specific fields.

Mr. Cottingham:

Do you have any field that has the condition of permeability that East Texas has?

A. No. I think East Texas is a separate and distinct field.

Mr. Cottingham:

When you talk about East Texas, then the door is closed.

796 When you compare East Texas with any other field, the door is practically closed. Isn't that your opinion?

A. I think that—

Q. What about Van?

A. Van is probably in a measure a comparable field although Van is a different type structure from East Texas. I don't know what the proration schedule is in Van or what they base it on. I don't have any knowledge of it at all. I know it is a different type of structure from East Texas.

Q. Now, Mr. Rowan, the fact that you would ultimately produce the amount of oil that you claim you are entitled to wouldn't relieve your situation now because it would limit and deprive you of the right to produce that oil now as you have a right to do, isn't that right?

A. I assume from your statement, Mr. Tilley, that you are asking me if the present method of proration was continued into effect and assuming that the time would take care of me and I would get my ultimate amount of oil under the present schedule?

Q. Yes.

A. I don't think I would get it.

Q. I say if you did, you claim that the time element would still be confiscation?

A. That is right.

Q. You have a right to your equal opportunity to produce now?

A. Yes, I think I should have. I think I am entitled to it now and think I have been deprived of it for five or six years.

Q. At the present time you will lose your energy and also your right to produce now your fair share of the oil?

A. Yes, sir.

797 Q. The Railroad Commission of course has logs of all the wells in the East Texas field; doesn't it?

A. Yes, sir. I think that the rules and regulations require that you have to file a sworn log.

Q. Do those logs show the penetration of the well in the saturated sand?

A. They are supposed to. That is the way contour maps are drawn—

Mr. Cottingham:

You say they are supposed to?

A. Yes.

Mr. Cottingham:

What do you mean by supposed to? Don't they reflect the actual sand conditions?

A. They are supposed to.

Mr. Stanberry:

Some of them might and some of them might not?

A. I think they are subject to error on the part of the man who is making the log, the driller.

Mr. Stanberry:

And whether he swore to the truth or not?

A. Yes.

Questions by Mr. Cottingham:

Q. How do you make the logs? Most of them are drilled with rotaries?

A. Yes.

Q. After you encounter the top of the Woodbine—

A. The log is either made from the core record or from the driller's knowledge of how the sand or formation drills and the way he logs it, whether he logs it sand or shale.

Q. Can the driller determine from how it is drilling whether he is drilling in sand or shale?

798 A. Yes, if he is a good driller.

Q. I am wondering how many good drillers they have.

A. They did have a bunch of good ones. I don't know how many there are now.

Q. This is the point. It is a serious point because when you take a driller's log of a rotary well and try to compare it with core tests—did you ever try to do that?

A. Yes.

Q. Did they compare favorably?

A. I have not only compared them with core tests but I have also compared them with Schlumberger tests and I know of driller's logs that are 98% accurate. I have in mind a well I drilled for Stanolind which compares with the core record and the Schlumberger record and was practically a perfect log made by the driller. That was in the Gulf Coast field. That was one comparison which I have made. I have compared driller's logs on a number of occasions with Schlumberger records.

Q. Can you tell what portion is saturated?

A. Not except by coring or Schlumberger.

Q. Can a Schlumberger tell?

A. Not 100% accurate.

Q. About what per cent would you say the Schlumberger could tell you even in non-producing horizons?

A. In non-producing horizons I think the Schlumberger is pretty accurate. It will make some errors. I think a Schlumberger can tell you accurately the sand and distinguish it from the shale or non-porous matter.

Q. How many Schlumbergers out of the 25,000  
799 wells in the East Texas field have been made?  
How many wells have had Schlumbergers?

A. Not a whole lot.

Q. Would you say 10% or 5%?

A. I doubt if it is 5% but I imagine there are more Schlumberger logs in the East Texas field than there are key wells which you are using for potential tests. For that reason I think your percentage of accuracy in making a sand map would be greater than the percentage of accuracy in the potential map.

Q. What does the potential of wells—does that reflect permeability?

A. I think so.

Q. Porosity?

A. To a very limited extent.

Q. Sand thickness?

A. Yes, to a limited extent.

Q. What else? Does it reflect pressure?

A. Yes.

Q. In other words the potential reflects all the factors which go into the ability of that well to produce over a certain period of time?

A. Yes, sir.

Q. But it doesn't tell you how much oil is in place?

A. No, sir, it doesn't.

Q. The driller's log gives a better index to the condition of that well to produce than the actual potential?

A. The core record would give a better picture of the oil content of the reservoir than the potential.

800 Q. All right. Let's see if it will. Did you ever see any cores of the deep Ordovician horizon in Big Lake which produces four to five thousand barrels a day?

A. No, I never did.

Q. Did they show anything—

A. I don't know, I'm not familiar with them.

Q. Have you seen logs that didn't show anything from a core standpoint which produced large quantities of oil?

A. You mean the cores didn't show any oil?

Q. Yes.

A. And didn't show any porosity?

Q. It showed poor conditions of porosity and permeability.

A. And no saturation, and yet it produced?

Q. Yes.

A. No, I have never seen that in my life.

Q. I have.

Mr. Stanberry:

Have you drilled any wells in the Ranger field?

A. No.

Mr. Stanberry:

Do you know anything about that area?

A. Very little.

Mr. Stanberry:

Have you ever heard that a great many of those wells up there when drilled in with cable tools showed a rainbow and then made five or six thousand barrels?

A. No. I don't know that I would say I have heard of it from a rainbow to five or six thousand barrels but I have seen instances where you had a small well before it was shot and a large well after it was shot.

801 Questions by Mr. Tilley:

Q. Mr. Rowan, you have estimated or calculated that the total acre sand thickness in the East Texas field is 5,300,000?

A. Yes.

Q. And that your Todd B lease is 2499?

A. Yes.

Q. And the number of wells you used was 24,710?

A. Yes, sir.

Q. As to the field and five as to your lease?

A. Yes, sir.

Q. The approximate number of wells now is 25,000 which only makes the condition a little worse?

A. Yes.

Q. The average density in the field is 5.12?

A. Yes, sir.

Q. And your actual density is 5.00?

A. Yes.

Q. The average potential in the field—

A. I am a little lower than the average.

Q. You took the average potential which is 605 for the field as against your potential for your lease of 964?

A. Yes, sir.

Q. Then you have taken an allowable of 499,986.7?

A. Yes.

Q. The present allowable per acre is 3.955?

A. Yes, sir.

Q. And for your lease it is 4.480?

A. That is correct.

802 Q. You have attended the recent Commission hearings, haven't you, in which Mr. Cottingham has testified with reference to the pressure drop in the East Texas field?

A. Yes, sir.

Q. From your study and from his testimony and from the evidence you have been able to gather, it is your opinion that there is a continual pressure drop in the East Texas field under the present rate of withdrawal?

A. Yes, sir.

Q. That means as more wells are granted by the Railroad Commission that either one of two things must

happen; that the allowable of the wells in the field must be cut or the allowable for the field must increase.

A. Yes, that is correct.

Q. If the allowable for the field increases, under Mr. Cottingham's testimony and everybody else's opinion, that will create unnecessary waste?

A. Yes, sir.

Q. Then the only alternative to give you the protection you are entitled to isn't by the drilling of additional wells by anybody in the field but it is by adjustment in the allowable.

A. That is correct.

Q. Is the East Texas field drilled to such an extent now that there is probably 1 well on every 10 acres in the field?

A. I think it is, Mr. Tilley.

Q. That is all.

803 Questions by Mr. Stanberry:

Q. Mr. Rowan, I believe you have just testified that if the allowable was increased it would create unnecessary waste. Was that your testimony?

A. Yes, sir. The allowable for the field.

Q. If you take this thing on the basis of the marginal well law, then is there any such thing as adjusting these allowables on the basis which you ask for without raising the total field allowable and thereby creating the waste which you say will occur if we cannot cut the marginal wells below 20 barrels?

A. No, sir.

Q. Then when we adjust it according to your plan which you lay out, have you figured how much that would increase the field allowable?

A. Not considering the marginal well law, I have not. It would materially increase it though.

Q. That would bring about unnecessary waste?

A. In my opinion it would.

Q. You want us to adopt a method of allocation and proration which would bring about unnecessary waste?

A. No, I don't.

Q. If we can't adjust it the way you request without increasing the allowable and then increasing the allowable will create unnecessary waste, then won't it necessarily follow you are asking us to adopt a method of proration which would create unnecessary waste?

A. Mr. Stanberry, in 1933 I filed suit in the Federal Court in Fort Worth against the Railroad Commission because I complained of the fact that they shut  
804 down my property in East Texas, and your Commissioner Mr. Thompson came to Fort Worth and sat in my office and discussed that lawsuit with me. He said at that time—he asked what I was wanting and what I was contending for in the way of equity and I told him. I asked him in that conversation "What are you going to do when you get 25,000 wells in East Texas and the marginal well law catches up with you? Would you put the field back on a per well basis because all the testimony of the engineers has been that between four and five hundred thousand barrels is the maximum that field can produce without physical waste." He said "We don't have to abide by the marginal well law in prorating flowing wells in East Texas" and I assumed he knew what he was talking about and was telling me the truth and that you don't have to abide by the marginal well law.

Q: Did you ever know any lawyer that knew exactly what the law was?

A. No. But I was talking to the law in Texas so far as oil and gas is concerned and that was the Chairman of your Commission.

Q. The Court would decide that. Did you ever know any lawyer that always knew the law except the man writing the decisions?

A. No, he is the only one supposed to know the law. I don't have any knowledge right now of any Court in the United States or the State of Texas which has said that the marginal well law is constitutional.

Q. Nobody has doubted it enough to attack it.

Questions by Mr. Tilley:

Q. We are right now if it does mean that. Mr. Rowan, if the Supreme Court had any general idea what it was talking about in Brown vs. Humble and if the  
805 Federal Court had any general idea what they were talking about in the ..... case, then one of two things must happen that in order to give an operator in the East Texas field the right to produce his fair share of the oil, he must be given an adjustment of allowable or must be given additional wells. That is the only way he could get his fair share of the oil. Now if the law is that the Railroad Commission cannot be forced to make an adjustment in the allowable, then there is only one remedy left for the operator now being discriminated against and that is to drill additional wells. Then I will ask you a question on that premise of law that if additional wells must be drilled there must be a substantial number of wells drilled you say in order to give the adjacent lease owners and others similarly situated more oil. That means there will have to be drilled such a number of wells that if each well is given 70 barrels a day, the allowable of 500,000 barrels a day must be exceeded, then if that is done and those additional permits are granted, that means that waste will be created, doesn't it, if the allowable exceeds 500,000 barrels a day so that one of two things must follow: The marginal well law must fall or be so construed as to not do that or the Constitution must be done violence to because it says that the Legislature shall pass laws to conserve the natural resources of this State; is that right?

A. I think you would have physical waste, yes, sir.

Q. The fact question which I wanted to ask you was this; aren't there enough leases probably in the East Texas field that are drilled like your lease that in order to be put

on a parity with the other operators in the field  
806 and have an adjustment in allowable they would

have to drill such a number of wells to get their fair share of the oil that the marginal well allowance of 20 barrels a day would put them above the 500,000 barrels a day and then you would be on a per well basis?

A. You would be on a per well basis and I think that the field allowable would keep steadily climbing to a point where you would have physical waste in the field.

Mr. Stanberry:

If the Commission shouldn't comply with your request and adjust your allowable on an acre foot of sand basis, you think they should take into consideration in granting permits or drilling wells the sand thickness?

A. I don't see how they could do that. It might be possible for them to do that. I don't see how they could do that. I think that probably in the fairway with the thick sand section, in that portion of the field it would probably be drilled up to a greater density than the rest of the field but I don't think that is a factor that has been considered heretofore in granting permits.

Mr. Robertson:

It has been argued in some hearings which I have attended. Mr. J. S. Hudnall testified to that effect.

Mr. Tilley:

That is all.

Questions by Mr. Rauhut:

Q. Sun Oil Company owns a lease on the Allen Tooke 50 acre tract. Its lease has a similar sand to your lease, according to your information, doesn't it?

A. As far as I know, it has.

807 Q. They have about 10 wells on that 50 acre tract, don't they?

A. I don't know for sure but imagine that is correct.

Q. The allowable for those wells is about the same as your well?

A. Yes, sir, that is correct.

Q. As between your lease and the Sun lease each of them occupies about the same position and one doesn't have any particular advantage over the other or any particular disadvantage?

A. No, I don't think so.

Q. Are there any wells on the west side of the field—you say generally the wells on the west side have a higher potential than the wells on the east side?

A. I think so.

Q. Even though they may have the same sand thickness on the extreme west edge and the extreme east edge?

A. Yes, sir.

Q. The difference in potentials between those wells on the extreme west edge and the extreme east edge doesn't indicate what additional quantities of oil are in place under the wells on the east edge?

A. It doesn't indicate any additional what?

Q. It doesn't indicate that wells on the west edge have any more oil in place?

A. No, sir, it doesn't. It indicates they have more reservoir energy to utilize to get the oil.

Q. It is closer to the source of the pressure.

A. That is right.

Q. And perhaps a more permeable and porous sand?

A. Yes, sir, it is.

808 Q. The potential factor doesn't necessarily indicate the quantity of oil in place?

A. No, sir, it doesn't at all.

Q. You say wells on the east side producing from four feet of sand for instances—I believe that is the thickness

you used in your testimony—would have a longer producing life than wells producing from four feet of saturated sand on the west side.

A. I believe they will.

Q. Is that because there is more oil in place in the four feet of sand on the east side than under the four feet on the west side?

A. No, sir. There would be the same amount.

Q. Why is that?

A. Because of peculiar conditions in the structure. I think some drainage would take place from west to east.

Q. The wells on the east edge will produce from the same sand thickness as compared to wells producing on the west edge but will have a longer life through drainage from the area to the west to those leases on the east edge.

A. That is correct.

Q. With reference to the basis of taxation I want to ask about that. Do they tax you over there on the basis of the estimated sand thickness?

A. No.

Q. Is each acre taxed equally whether it is on the east edge, west edge, or middle of the field?

A. Mr. Rauhut, I haven't attended one of those equalization board hearings in several years but the ones I attended they gave a greater valuation to the  
809 leases in the middle of the field than they did to the leases on the east or west. They took into consideration or tried to take into consideration the fact that the leases in the middle of the field were more valuable by having a greater sand thickness and a greater amount of oil in place.

Q. I understood from your testimony that you are still of the view that there should be a top allowable for the field.

A. That is correct.

Q. And that the top allowable which now exists is in the neighborhood of being correct?

A. It is probably a little high.

Q. And that there should be some proration order?

A. Yes, sir, I think you need proration.

Q. Also I understand that there should be some restriction on the number of wells to be drilled in the field and the spacing of wells or distribution of wells?

A. Yes, sir.

Q. You have no quarrel with Rule 37 as to spacing?

A. I have a quarrel with the administration of it in East Texas. I don't think they should let a man drill 15 wells on 3 acres.

Q. I understand but leaving out of consideration any matters of administration you think there should be a spacing rule and it should be enforced?

A. Yes, I do.

Mr. Cottingham:

Do you know how many wells that the Commission has denied permits on, the Courts have permitted to be drilled under injunctions?

A. No.

810 Mr. Cottingham:

In the early history of the field?

A. No, sir.

Q. I think you could say that during Mr. McCraw's administration there have been none.

Mr. Robertson:

I don't know of but one in the last two or three years. There was an injunction granted about two or three months ago.

Mr. Rauhut:

The decisions came out about that time.

A. I think that the Courts have been equally prone to uphold any exception to Rule 37 that you might grant. I don't know of any well that has ever been plugged where the operator went to Court and tried to set aside the order of the Commission.

Mr. Burke:

Wasn't the Whittington well plugged on the church property there in the middle of the field?

A. Probably. I don't have any knowledge of it.

Mr. Granberry:

During the early days of the field there were numerous Court injunctions granting wells.

Questions by Mr. Tilley:

Q. Mr. Rauhut asked you this question and I want to be sure you understood the question. You say that you have no quarrel with Rule 37. You mean Rule 37 as a spacing regulation and not with a provision in it that exceptions can be granted to prevent confiscation of property where the granting of that well under that exception would give that fellow a greater advantage over the adjacent lease owners than the adjacent lease owners had over him before the permit was granted?

A. I said the basic Rule 37 I had no quarrel with but I do have a quarrel with the idea that they give  
811 a man an exception to Rule 37 in order to protect vested rights and then give that man license to take something he doesn't own and give him the right to do the very thing I complain of if they don't give me the right to drill.

Q. This is your argument, that they gave Mr. Wood a permit to protect vested rights on his .1 of an acre?

A. That is right.

Q. And in order to prevent confiscation they gave him this permit and then he confiscates more of your oil than you were confiscating of his?

A. They gave him the license to do it, yes, sir.

Q. So if you just continue that, you will keep on drilling and pretty soon you will have 75,000 wells over there.

A. I guess that is a fact.

Questions by Mr. Cottingham:

Q. Do you believe that the more wells you drill the more oil you get?

A. Not under proration I don't.

Q. Do you under open flow? Will it allow more oil to be recovered if you drill more wells?

A. I believe it would.

Q. What is the difference?

A. The difference is you utilize the reservoir energy under proration and under open flow you wouldn't.

Q. What forces do you have which would force oil in the hole?

A. In East Texas?

Q. In any field.

A. It depends on the field. Some fields have a  
812 water drive and expansion of gas.

Q. Don't you have water drive and expansion of gas under open flow?

A. You do but you don't utilize it efficiently. You utilize it inefficiently and it acts as a detriment instead of a conservation measure. Your water comes into the well head under open flow and comes in unevenly instead of coming in on an even keel.

Mr. Tilley:

Mr. Cottingham, you have testified at a number of these proration hearings?

Mr. Cottingham:

Yes.

Mr. Tilley:

The public is permitted to interrogate you?

Mr. Cottingham:

Not when I am holding a hearing.

Mr. Tilley:

You won't give us a right to interrogate you at this time?

Mr. Cottingham:

I am not a witness.

Mr. Tilley:

I am calling you as a witness now.

Mr. Cottingham:

When I am one of the Examiners, I don't think that will be correct.

Mr. Tilley:

Will you let me put your assistant engineer on the stand?

Mr. Cottingham:

This is your case and you have your witness.

Mr. Tilley:

I am asking you to put the Railroad Commission's Chief Engineer on the stand and if refused that right I want to put his first assistant on.

813

Mr. Cottingham:

We aren't furnishing the evidence in this hearing.

Mr. Tilley:

I am not going to ask him for expert testimony but for information which you have by virtue of your public services.

Mr. Stanberry:

Before you take another witness, I have a few questions I want to ask. Mr. Rauhut, you represent the Sun Oil Company?

Mr. Rauhut:

Yes.

Mr. Stanberry:

You represent none of your other clients in this particular hearing?

Mr. Rauhut:

No.

Mr. Stanberry:

You represent the Shell and Magnolia?

Mr. Robertson:

Yes. I came up to protest the application for the wells. At the first hearing held I made a statement that neither the Shell nor the Magnolia took any position at all with reference to the request for an adjustment of the allowable and that still is my position. I am here to protest the granting of these twenty or twenty-five permits. As far as the other part is concerned, I am taking no position at all.

Mr. Stanberry:

I wanted to ask you what your position was on the alternative proposition.

Mr. Rauhut:

My position is that we protest vigorously the granting of each additional well sought as an exception to Rule 37 because we think that the record shows that there is no ground for an exception. So far as the application for an adjustment of allowable is concerned, the Sun Oil Company itself at a prior hearing told the Commission  
814 several years ago itself sought an adjustment in allowable or at least Mr. Heath testified on the matter at a Commission hearing. I think that the Company explained itself at that time as being in favor of an adjustment of allowable and thought that it was something which should be done about it. I am not here to state their view on the adjustment of the allowable at this time and I am not having anything to say about it. I don't want to say anything that would be inconsistent with anything they have done in the past on the matter and if there is any adjustment of the allowable on any lease we don't expect by our silence to be prejudiced in our right to have a similar adjustment. We expect an adjustment on our lease if there are some handed out.

Mr. Stanberry:

I wanted to know what your position and Mr. Robertson's position and the other people who have entered appearances would be on the alternative proposition.

Mr. Rauhut:

I am not here to encourage or protest the application for an adjustment of the allowable but we give notice that we are not conceding that one fellow should get an adjustment without us getting it.

Mr. Robertson:

Our position will be the same as that.

Mr. Cottingham:

Back to the hearing which you spoke of when the Sun Company furnished the technical witness on adjusting the allowable, at that time the allowable was around 29 barrels per well, wasn't it?

Mr. Rauhut:

I couldn't tell you exactly. It was my recollection off-hand that the allowable was much higher per well at that time. That was back in about 1935, though; I guess.

Mr. Cottingham:

Assuming that it is as you remember the testimony—I think it was 29—but whatever it was assuming that it was 29—

Mr. Rauhut:

I believe you are more correct than I am.

Mr. Cottingham:

The testimony at that time was to the effect that if every 10 acres was to get 29 barrels a well on 1 acre would get 2.9 barrels. Was that your recollection also?

Mr. Rauhut:

I didn't attend that hearing. I have heard something about it in a general way and know they developed what a small amount a small tract would get. I know from general information that there was a discussion of that.

Mr. Cottingham:

If that was the testimony that 1 well on a 1 acre tract would get 2.9 barrels, then the Wood well under that testimony would get .29 of a barrel per day, wouldn't it?

Mr. Rauhut:

If that is .1 on an acre, yes.

Mr. Cottingham:

Your position is the same—the Sun Company's position is the same today as it was then?

Mr. Rauhut:

I am stating that I am not here to assert any position with reference to the adjustment of the allowable either to urge it or to protest it. That I am remaining silent on that point but don't want my silence to be construed that we are willing for the allowable to be adjusted on the Rowan & Nichols lease and not be adjusted on ours.

Mr. Cottingham:

Were you present at that prior hearing?

816 Mr. Robertson:

Yes, I was present part of the time but I don't know all that took place. My attitude is like that of Mr. Rauhut. I attended the original hearing on Mr. Tilley's application for these twenty wells and stated that I was taking no position whatever with reference to the adjustment of allowable but was only protesting the granting of any permits for any of these wells and that is still our position, and it is the only position we have taken in this hearing or that hearing. We neither say—if anybody else's allowable is adjusted, we might then take a position but I don't take any now.

Mr. Cottingham:

You aren't taking any now and neither of you advocate any adjustment, any re-adjustment of the present scheme or plan in East Texas.

Mr. Rauhut:

No.

Mr. Robertson:

We are taking no position one way or the other on the question of the adjustment of the allowable.

Mr. Rauhut:

I haven't been employed to appear on anything but the Rule 37 feature of the case.

Mr. Stanberry:

Mr. Rowan, you say that the reason that these wells with four feet of sand on the east side will produce longer than wells with four feet of sand on the west side is because the pressure is driving the oil east?

A. You are talking about under the present plan of proration?

Questions by Mr. Stanberry:

Q. Yes.

A. Yes, sir.

Q. If that is true as to the shallow sand, then isn't it also true that under this restricted rate of flow  
817 water is washing the oil out of the thin sands on the east side and flowing it toward your lease?

A. No.

Q. Why will it drive one way or part of the way from west to east and not the balance of the way?

A. Because we have—with 2 feet of sand on the west they are producing 22 barrels a day where they only have 2 feet of sand to drain from and we have 50 times that much, and you are giving us practically the same allowable as those people on the west. How can we get any oil from them?

Q. The pressures are higher on the west than on the east, aren't they?

A. Yes.

Q. Doesn't the pressure gradient come down from the west to east?

A. Yes.

Q. If the higher pressure is in the fairway will drive it to the low pressure on the east, then why will not the high pressure in the water area drive it toward the fairway?

A. How can you drive it when you aren't letting us take it out?

Q. You are taking some of it.

A. We are taking a little. If we took more than our pro rata part of the oil under the fairway there would be a migration of oil.

Q. Which of the pressures are higher, on your lease or on the west side where water comes in?

A. They are higher on the west.

Q. If the higher pressures—if the pressure is higher on the west, where is there no drainage of oil toward the low pressure area?

A. - You can't drive oil unless you pull out the  
818 stop cock and take it out.

Q. You have already opened it up because the pressure is lower. If the pressure is lower—if the higher pressure in the fairway will drive it toward the low pressure on the east side, why won't the high pressure on the west side drive it toward the fairway?

A. I am talking about ultimately.

Q. I am talking about now. I thought you were talking about now.

A. I am talking about the ultimate recovery. When the water reaches my leases then my leases will be the high pressure leases, the highest pressure leases in the field; isn't that right? They should be any way.

Q. The thing is this that if you have your lowest pressure on the east side and your highest pressure is on the west side and your oil is migrating from the fairway to the east side because of the high pressure, then why isn't it migrating from the west side into the fairway because of the differential in the pressure.

A. That is the very thing I have argued; that you should have a gradient. And by virtue of the high pressure you should give them a higher allowable.

Q. You think that the west side wells with the highest pressures should have a higher allowable than your wells?

A. I don't think so, no. I think you should take into consideration that pressure and should also take into consideration the sand thickness too.

Q. How much consideration of pressure—you  
819 take an east side well with four feet of saturated sand and a west side well with four feet of saturated sand. How much more allowable do you think the west wells should have than the east wells?

A. I don't know. You have engineers to figure that out. Certainly it should have more.

Q. Whenever you try to figure that and the sand thickness you would have a job figuring it, wouldn't you?

A. I don't think so. I think you could make an order which would be ten times more equitable than the one you have.

Q. Part acreage, part pressure, and part sand thickness, a combination allowable?

A. Yes.

Mr. Cottingham:

Under your suggestions would the Commission have to do away with the marginal well statute?

A. I think they would to do equity between leases.

Q. Could you outline a plan of proration which you would recommend based on those three factors and submit it to us?

A. I could give you my ideas about it.

Q. We will appreciate it. That is all.

Mr. Tilley:

Mr. Cottingham, I don't want to embarrass you but I will again ask you—

Mr. Cottingham:

I am not a witness in this case.

Mr. Tilley:

I know that you are not but notwithstanding that you are still the Chief Petroleum Engineer or whatever your official capacity is and you are the engineer for the Railroad Commission.

Mr. Cottingham:

Yes, and I came here to hear this case so that I can advise with the Commission.

820 Mr. Tilley:

I know why you came here. The reason I want to question you is because I want to know here and now if there is any of this testimony which you take issue with, and if there is, I am willing to substantiate that testimony by you yourself or any other competent engineer in this State.

Mr. Cottingham:

We will be glad to hear any of the engineers at this time which you have with reference to that and then when the record is made, as one of the Examiners I would be glad to submit that to the Commission for their consideration.

Mr. Tilley:

Mr. Cottingham, you as engineer for the Railroad Commission have within your knowledge peculiar information which isn't available to me and my client and we are not able to go out and hire a high salaried engineer, but I thought you were paid for the purpose of testifying because in every hearing I have been in you have offered your testimony and been subject to cross examination. I only ask for my day in Court to determine whether or not this Commission takes issue with any fact that my client has testified to and if you do, as to whether or not you can know or already know what the sand thickness is in that field, about the permeability and porosity and those matters I want to interrogate you on.

Mr. Burke:

I would like to ask Mr. Rowan one question.

Mr. Tilley:

Let the record show that Mr. Cottingham most respectfully declines to let me cross examine him or his chief engineer.

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Mr. Cottingham:

I think that is an unfair attitude to take as I am one of the Examiners here. You ask me whether I think his testimony is correct in all its ramifications—

Mr. Tilley:

I wouldn't want to embarrass you.

Mr. Cottingham:

You aren't embarrassing me but I don't think that is a fair attitude to take with reference to me. I came here to hear your case and then you want to ask me what my recommendation is going to be to the Commission.

Mr. Tilley:

No.

Mr. Cottingham:

That is what you are asking.

Mr. Tilley:

I didn't ask that at all. I think I know what your recommendation would be to the Commission, but I don't think the Commission would follow it. I have profound confidence in you as an engineer. What I want to question you about is purely engineering facts that may not be peculiarly within your knowledge but are certainly within your knowledge as far as my client is concerned because he doesn't have all that statistical information and data which you have at your finger tips which you could testify to without referring to any records, and I want the Commission to make that evidence available here but if you can't do that, there isn't a thing I can do about it, and I intend to show you no discourtesy because I have a very profound regard for you.

Mr. Burke:

Mr. Rowan, in the file in the case of Rowan & Nichols vs. the Railroad Commission and R. M. Wood you did have a geologist, a man named Mr. Sorenson, to appear for you and give testimony, didn't you?

Mr. Rowan:

I did not.

8-2 Mr. Burke:

In the trial we had Mr. Sorenson testified, didn't he?

Mr. Tilley:

He never paid Mr. Sorenson one dime. He was the Shell's witness.

Mr. Burke:

He was there at the time and also testified.

Mr. Tilley:

He was there witness.

Mr. Burke:

Mr. Rowan, another question—

Mr. Rauhut:

Just a minute. Who is it that is supposed to have testified?

Mr. Tilley:

Sorenson.

Mr. Rauhut:

Sorenson didn't testify there.

Mr. Burke:

Were you present when we tried that case.

Mr. Rauhut:

No.

Mr. Burke:

How do you know who testified?

Mr. Rauhut:

The only Sorenson I know doesn't work for the Shell.

Mr. Burke:

I don't know who he works for but he was present at that trial. If you weren't present at the trial, how do you know?

Mr. Rauhut:

I think you are mixed up about that. The only petroleum geologist or engineer named Sorenson around here works for the Humble and wasn't in that case.

Mr. Burke:

You say you aren't able to employ an engineer to be here; is that right?

Mr. Rowan:

I didn't say that.

Mr. Burke:

Mr. Tilley made that statement. Is that correct or incorrect?

823 Mr. Rowan:

It depends on how much he would charge me.

Mr. Burke:

You knew this hearing was coming up, didn't you?

Mr. Rowan:

Yes.

Mr. Burke:

You could have employed an engineer, couldn't you?

Mr. Rowan:

I don't know.

Mr. Burke:

You did employ one to compile the facts from which you have testified, didn't you?

Mr. Rowan:

No. I used my own geologist.

Mr. Burke:

You have a geologist in your employ?

Mr. Rowan:

Yes.

Mr. Burke:

What is his name?

Mr. Rowan:

His name is Allen.

Mr. Burke:

And works for you by the month?

Mr. Rowan:

Yes.

Mr. Burke:

You could have had him here.

Mr. Rowan:

Yes.

Mr. Burke:

That is all.

Mr. Tilley:

Mr. Rowan, Mr. Allen has made no particular study of the East Texas field, has he?

Mr. Rowan:

No.

Mr. Tilley:

Didn't you try to employ an engineer in the case you filed against the Railroad Commission and tried to get

a competent man who knew the East Texas field, and his fee was so high you couldn't employ him?

A. That is right.

824

Mr. Tilley:

That was David Donoghue?

A. Yes.

Mr. Burke:

What fee did he attempt to charge you at that time?

Mr. Tilley:

I don't remember.

A. I don't know. I don't remember.

Mr. Burke:

You don't remember what fee he tried to charge you at that time?

A. No.

Mr. Tilley:

I remember what it was.

Mr. Burke:

I am asking the witness.

A. I don't know.

Mr. Burke:

Then your statement that you just made about you trying to hire an engineer but he charged you so much you couldn't hire him, you are mistaken in that statement, aren't you?

A. No, I'm not mistaken.

Mr. Burke:

If you don't know how much he wanted to charge you to appear, how do you know you couldn't pay him? ]

A. Because I have a recollection of discussing the matter with Mr. Tilley and we talked about expert testimony and I discussed the matter of employing expert testimony and had a conference with Mr. Donoghue and he told me what it would be and we came to the conclusion we couldn't afford to spend the money at that time. I still say I don't know what the fee was going to be. I remember it was something more than I wanted to pay at that time.

Mr. Cottingham:

I don't think that has any bearing.

Mr. Burke:

I don't either but I thought he was very unfair to Mr. Cottingham. It was just to protect Mr. Cottingham.

825 Mr. Cottingham:

I thank you. Even if I wasn't the Examiner in the case like this, I think it is up to an operator to present his own case.

Mr. Tilley:

I merely wanted to protect every legal right my client has and I have examined every witness before the Railroad Commission hearings and I don't believe the Railroad Commission wants the public to know the facts and I want to put this on the basis we are trying to put it on for reasons I will not discuss here and I know just exactly your position and I sympathize with you and have no criticism to make of you.

Mr. Stanberry:

We will take the matter under advisement and make our report on the case but keep it open on the docket in case the Commission wants to hear it after we make our report from the transcript of the testimony, if they

want to hear any additional witnesses and get any additional information, so that they can do so.

Mr. Rauhut:

Would there be further notice of the hearing given in that event?

Mr. Stanberry:

Yes. I don't know whether they will have all the testimony they want or whether they will want to send for Mr. Cottingham to put him on the witness stand.

Mr. Tilley:

I want to make this observation that time is the essence of the thing with my client as we are being unduly drained with a heavy loss and we have tolerated this condition as long as we think we should and we will appreciate it if you will give it prompt attention.

Mr. Stanberry:

Case submitted.

826      The State of Texas,  
            County of Travis.

I, Louise Kirk, an employee of the Oil & Gas Division of the Railroad Commission of Texas, do hereby certify that the above and foregoing is a true and correct transcript of my notes made at the hearing held in Austin, Texas, at 10:30 A. M., May 4, 1938, to the best of my skill and ability.

Witness my hand on this the 9th day of May, A. D. 1938.

(Signed)

LOUISE KIRK.

Sworn to and subscribed before me, a Notary Public in and for Travis County, Texas, on this the 9th day of May, A. D. 1938.

(Signed)

ROSE MODRALL,

(Seal)

Notary Public in and for Travis  
County, Texas.

In line with the request made by him at the hearing, Mr. Rice M. Tilley, attorney for Rowan & Nichols Oil Company, submitted the following statement on May 10, 1938:

"There are 1740 wells on May 1, 1938, having an allowable of from 22 to 23 barrels a day; 430 wells having an allowable of 23 and over. Of the 430 wells, 102 of same have an allowable of 24 barrels and over, while 132 wells have an allowable of exactly 23 barrels. Of the 102 wells having an allowable of 24 barrels and over only 12 wells get as much as 25 barrels and over."

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Service Bureau Report.

Railroad Commission of Texas.

Oil and Gas Division.

Oil & Gas Dockets Nos. 108, 120, 123, 124, 125, 126, 128,  
129, 132 and 146.

In Re—Conservation and Prevention of Waste of Crude Petroleum Oil and Natural Gas and Relative to the Production, Storage, Transportation, Marketing or Processing of Crude Oil and/or Natural Gas and Relative to the Purchase, Sale, Transportation and Handling of Crude Oil and Natural Gas and all Products, By-Products and Derivatives thereof in the State of Texas.

Statewide Hearing held in the City of Austin, Texas,  
May 17, 1938, 10 A. M.

Before:

Hon. C. V. Terrell, Chairman;

Hon. E. O. Thompson, Commissioner.

## Appearances:

## Name.—Representing.—Address:

- Arnold, F. J., Republic Production Co., Houston, Texas.  
 Adams, E. D., Shelly Oil Company, Houston, Texas.  
 Atkins, J. B., Parado Gasolene Co., Inc., Shreveport, La.  
 Andrade, C., Great State Oil Corp., Dallas, Texas.  
 Allison, R. H., Houston Oil Fields, Houston, Texas.  
 Blair, M. W., Reynosa Oil Company, Wichita Falls.  
 Baker, Rex G., Humble O&R. Co., Houston, Texas.  
 Bass, Perry R., Bass & Dillard, Wichita Falls.  
 Buck, Raymond E., Barnsdall Oil Co., Fort Worth.  
 Barclay, F. C., East Tex. Independent Pet. Assn., Longview, Texas.  
 Cox, Mills, Mills Bennett Prod. Co., Houston, Texas.  
 Cullum, L. H., Perkins & Cullum, Wichita Falls.  
 Cochran, Roy L., Railroad Commission, Kilgore, Texas.  
 Cassidy, Fred M., Honolulu Oil Corp., Midland, Texas.  
 Debach, G. E., Hercules Gasolene Co., Inc., Kilgore, Texas.  
 Donnelly, A. S., Honolulu Oil Corp., Midland, Texas.  
 Daniel, T. B., Jacksonville, Texas.  
 Deputy, P. R., Ralph E. Fair, Inc., Dallas, Texas.  
 Hayes, E. P., The Texas Company, Houston, Texas.  
 Edwards, Haynie E., McElroy Ranch Co., Fort Worth.  
 Fuqua, H. B., Gulf Oil Corporation, Fort Worth.  
 Flesh, Daniel J., Harrison & Marion Co., Jefferson, Texas.  
 Gwilliam, R. C., The Ohio Oil Company, Houston, Texas.  
 Garrett, R. O., Arkansas Fuel Oil Co. & Arkansas Louisiana Gas Company, Shreveport, La.  
 Graham, Guy, Navarro Oil Co., Houston, Texas.  
 Gulcke, J. O., Panhandle Natural Gas Assn., Amarillo, Texas.  
 Hancock, John, T. P. Coal & Oil Co., Fort Worth.  
 Johnston, Ralph A., Johnston & Johnston, Houston, Texas.  
 Johnston, Edgar C., E. C. Johnston, Longview, Texas.  
 Jackson, F. G., Longview, Texas.

## Name.—Representing.—Address:

- Howard, Del, Cities Service Oil Co., Bartlesville, Okla.  
 Lusk, Dr. C. M., Houston, Texas.  
 Miller, J. S., Devonian Oil Company, San Antonio.  
 Moncrief, W. A., Showers & Moncrief, Inc., Fort Worth.  
 McCarty, J. A., Wichita Falls.  
 McGaha, C. P., Fair McGaha Oil Corp., Wichita Falls.  
 Nichols, Jack, Nichols Oil & Gas, Aramillo, Texas.  
 Noland, J. S., Barnsdall Oil Co., Tulsa, Okla.  
 Neel, Hawley G., West Central Texas Oil & Gas Assn.,  
 Fort Worth.  
 Owens, Joe, Sun Oil Company, Beaumont, Texas.  
 Friddy, W. M., Sabine Royalty & Tyler C. C., Tyler, Texas.  
 Patterson, H. J., Empire Pipe Line Co., Austin, Texas.  
 Pewitt, Paul H., Gladewater.  
 Park, F. D. G., E. C. Johnston, Longview, Texas.  
 Portorfield, R. R., Devonian Oil Company, Midland, Texas.  
 Parker, G. C., Sells Petroleum Inc., Longview, Texas.  
 Parks, A. S., Conroe Operators, Houston, Texas.  
 Rowan, A. H., and Rice, Tilley, Rowan Nichols Oil Co.,  
 Fort Worth, Texas.  
 Richardson, S. W., Fort Worth, Texas.  
 Read, Shelley G., Amazon Petroleum Corp., Henderson,  
 Texas.  
 Reed, Lisle, Peyton Bros., Mexia, Texas.  
 Showers, E. A., Showers & Moncrief, Inc., Houston, Texas.  
 Schroder, J. C., East Texas Independent Pet. Assn., Long-  
 view, Texas.  
 Sefinger, George W., Skelly Oil Company, Tulsa, Okla.  
 Smith, Howard C., Sulphur Springs, Texas.  
 Warner, C. A., Houston Oil Company of Texas, Houston,  
 Texas.

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Rice M. Tilley, representing A. H. Rowan, The  
 Rowan Nichols Oil Co.

We have asked for an adjustment in the allowable in  
 the East Texas field so as to give our company an oppor-

tunity to produce a fair share of the oil. We are here in view of the fact this affects the field as a whole and made necessary to appear and present our case in the state wide hearing.

I want to present at this time, and I want to be informed if it is not admissible, the record we made on May 4, before the Commission. I have Mr. A. H. Rowan who is ready to testify if required. I wish to say also that we have not yet gotten any relief in East Texas. The East Texas field is on the per well basis and we ask that the Commission relieve the situation as far as it affects us.

A. H. ROWAN, being duly sworn, testified as follows on Direct Examination by Mr. Tilley:

Your company, the Rowan Nichols Co., has leases in East Texas has it not?

A. Yes, sir.

Q. Where is it situated?

A. It is situated on the west line of the Castleberry league and labor survey in Gregg County.

Q. What is its relative position based on the recovery of the oil?

A. In the middle of the field. I may say it is situated in a most favorable position.

Q. How many acres do you have under lease?

A. I have two leases, one of 25 acres and one  
831 of 20 acres.

Q. On your 25 acre lease how many wells do you have?

A. Five.

Q. What is your allowable?

A. 110 barrels.

Q. What would you get under the marginal well basis?

A. 100 barrels.

Q. Under the present order of the Railroad Commission give us the maximum allowable?

A. 100 barrels.

Q. What is the sand thickness or condition over there?

A. The thickness of the sand is approximately 100 feet.

Q. What is the permeability and porosity of this sand?

A. It is uniformly good.

Q. What is the potential production of these wells?

A. One well on an adjoining lease has an actual potential of 965 barrels.

Q. You have as good a potential as is in the field?

A. It ranks nearly to the top.

Q. You have good sand conditions do you not?

A. Yes, sir.

Q. Also with the other oil factors are you not?

A. Yes, sir.

Q. Does your position in the structure have an advantage as compared to the other operators?

A. I think it has.

Q. Are you placed on a parity with the purest oil in the field under the present rules and order?

A. I am placed on a parity with the marginal wells of the purest.

Q. If one of your wells were allowed to recover on the oil in place, how much do you figure your allowable would be?

A. 236 barrels.

Q. You are getting an allowable of 110 barrels now?

A. That is correct.

Q. If you used a factor taking into consideration a potential of as much as 50 per cent, you would get substantially more than you can under this order?

A. Yes, sir.

Q. Have you asked the Commission to look into that?

A. Yes, we made an application and had a hearing on it.

Q. Is this a copy of the record?

A. Yes, sir.

Q. You are a drilling contractor, are you not?

A. Yes, sir.

Q. You are also a producer, are you not?

A. Yes, sir.

Q. You have drilled a number of wells, have you not?

A. Yes, sir.

Q. You understand the underground conditions, do you not?

A. Yes, sir.

Q. You heard the testimony of the Railroad Commission Engineers and others with reference to the East Texas field?

A. Yes, sir.

Q. You base your statements on the knowledge you have?

A. Yes, sir.

Q. If you were given a permit to drill additional wells, would that in any way prevent waste?

833 A. No, sir.

Q. It is useless expenditure to drill additional wells?

A. Yes, sir.

Q. You can produce a fair share of the oil with the wells you have now?

A. Yes, sir.

Q. Spaced according to the regulations of the Railroad Commission?

A. Yes, sir.

Q. Will there be any appreciable amount left if you produce 236 barrels per day with your wells?

A. I would get my fair share of the oil and the field would drain properly.

Q. Would numerous wells create or minimize the fire hazard in this field?

A. These additional wells would create a fire hazard.

Mr. Tilley:

We offer in evidence the affidavit of Mr. A. C. Allen in support of these statements in this record.

Col. Thompson:

Your request is for additional drilling on this 25 acre tract?

A. My request is for the adjustment of the allowable.

Q. You have this 25 acre lease with 5 wells on it?

A. Yes, sir.

Q. Would the density of a tract of about 8 times in size as yours be about the same?

A. It would be approximately the same.

Q. Would it be wrong to say your density is slightly greater than one mile around your lease?

A. I would say about the same.

834 Q. How does the density on your tract compare with the entire field?

A. I have not figured it but I imagine it is about the same.

Q. Would it be wrong to say you have drilled more densely than the entire field?

A. I would say about the same.

Mr. Tilley:

Within five feet of your tract is what is known as the Wood well?

A. Yes, sir.

Q. On what size tract is that well located?

A. My engineer has computed this tract and he has in acreage about  $1/10$  of an acre. We think however that this well is on the Shell property.

Q. This well is given the same allowable as you are, is that right?

A. Yes, sir.

Q. You have been asked as to the density of the surrounding acreage. The East Texas field is a common pool, is it not?

A. Yes, sir; I think so.

Q. If a well is drilled in East Texas you find a similarity of structure and a big part of East Texas will feel the effect of that drainage would it not?

A. Yes, sir. I think it would.

Q. Within two miles of your lease with the same density, and we know that because they are thickly drilled with wells, would that not injure your recovery?

A. I think it would.

Q. Does the density have anything to do with 835 the amount or recovery if uniformly drilled?

A. I don't think so, you should have uniform spacing and uniform drilling.

Q. You are being denied the opportunity to get your fair share of the oil in spite of the fact some are dense and some are not?

A. Yes, sir.

Col. Thompson:

Is it your request that those wells on small tracts be given small allowables and the wells on the larger leases be given the larger allowables?

A. Each well should get a fair share of the oil.

Q. If one well is on a 5 acre tract and another is on a City lot, the 5 acre tract should be given more allowable than the City lot?

A. That is correct.

Q. This is the same acreage proration argument we have had with us for many years.

A. Yes, that is my position.

Q. Would they want that?

A. The sand thickness should be considered in this proration. That is a fair and more equitable to East

Texas. One should not be allowed to drill three or five wells on five acres on any sectionized and to my one well on one acre.

Q. You understand the rule we have been trying to use is to take an area 8 times the size of the tract in question?

A. That is true but not right.

Q. We take all the field density to approximate the result you have?

836 A. I don't think so.

Q. It is an attempt to do that?

A. I don't think it does it.

Q. But our attempt is interfered with because there are town lots and small tracts which we are required to deal with alone.

A. Yes, but that would be two or three wells.

Q. The Commission has refused these wells on these small tracts and they go to Court and get them.

A. I have not stated that.

Q. This causes the Commission to be tied in not promising or permitting them to drill.

A. They should not be allowed two or three wells on the small tracts less than the spacing rules.

Q. The agreement has been changed recently and there are now more than 1141 independent producers than there were two years ago?

A. I had an idea they were going light.

Q. Our records show there are 1141 more independent operators than there were two years ago.

A. That may be true.

Q. What we have tried to do is to handle this situation so as to please every one and to get each one an opportunity to get some oil.

A. I admit you have a hard job.

Q. We are trying to gather the oil, but everytime you bring in a well you increase the production. What do you think of setting the top allowable in Texas?

A. I think it is a good idea.

837 Q. Will more wells drilled in reduce the allowable on each well?

A. Yes, sir.

Q. You would suggest then a figure that can not be exceeded?

A. Yes, sir.

Q. Would you suggest such a change or policy to the Commission?

A. Yes, sir.

Q. How would it work out in the KMA field?

A. It would have to be raised from time to time as the limits of the field are extended, and as new production develops and the reservoir conditions are determined. It might be necessary to increase the top allowable, but when the maximum had been reached without physical waste, taking into consideration the market demand.

Mr. Tilley:

You base your testimony on the fact that you are entitled to your fair share of the oil and that East Texas should be prorated in accordance with the rules and not redistributing the wealth to the operators?

A. Yes, sir.

Q. The driller on the small area should get his cost back?

A. I don't think so.

Q. If a man drills a well on say 1/10 of an acre and does not get a well to pay him back the cost of this drilling?

A. He is as foolish as trying to build a large hotel in the middle of the desert and expecting people to come there.

Q. Mr. Wood is encroaching on your property is he not?

A. Yes, sir.

838 Col. Thompson:

Suppose a man had a tract in East Texas, say a 30 foot Church lot; under your theory, which you have suggested, that he be allowed to recover the oil under that tract, and his allowable is so small that he can not drill the well; where will he find a market for his land. Who would buy it, would anyone buy it?

A. I doubt it.

Q. Then the others on the adjoining tracts would get his oil and he would receive nothing for it.

A. Unless the rules would permit the consolidation with another tract and drilling for the benefit of all parties.

Q. You understand the statute prohibits us from having compulsory consolidation?

A. It is being done.

Q. That is a voluntary consolidation?

A. Yes, sir.

Q. The man does not want to voluntarily come in and we could not compel him to come in and no one would buy his land, and he could not get his oil without drilling?

A. Yes, that is right.

Q. If the man does drill on this 1/10 of an acre and his allowable is fixed so as to take into consideration his size and ability to produce can he not be given a fair share of the oil?

A. Yes, sir.

Q. Do you know the taxable values of Gregg County?

A. No, sir.

Q. It was 8,000,000 dollars in 1931, was it not?

A. Yes, that is correct I think.

Q. Do you know what it is today?

839 A. It is 88,000,000 dollars.

Q. That is a great benefit to the business?

A. It is a lot for the people.

Q. Would fair drilling rules be of benefit?

A. No, sir.

Mr. Allison:

In my opinion the State of Texas does not prohibit the order of the Railroad Commission requiring the compulsory policy for the smaller tracts to carry out the uniform spacing and further more the Commission had issued such an order in the Hastings pool near Houston and it was up for hearing in the Federal Court and they held that the Railroad Commission had the power to require the pooling of the smaller tracts.

Col. Thompson:

Did not that involve some city ordinances or something like that.

Mr. Allison:

There was one order passed by the City of South Houston and another order passed by the Railroad Commission of Texas, an independent order. The case was filed under one order and the cases were separated in the Court because the City order required a One Judge Court and the order of the Railroad Commission required a Three Judge Court. The One Judge Court had heard the order of the South Houston, and the other Court tried the independent order of the Railroad Commission. However independent of this under the present statutes the Railroad Commission has the power to compel, or they have full authority under the present statutes to require uniform spacing and take from the smaller operator

840 and save his money.

Col. Thompson:

Did you say save his money?

A. Yes, sir.

Q. By securing to him the right to drill for oil?

A. He has one well on 5 or 10 acres instead of four.

Q. He might not get out of that well the cost of the drilling?

A. The Railroad Commission selects the driller.

Col. Thompson:

We select the driller? I have never read into the statute that we must pick a driller for any one to drill his wells for him.

A. If you have a hearing and issue an order and have entered your decision for the drilling of one well.

Col. Thompson:

I will tell you what we did. Recently South Houston has passed a city ordinance against fire hazards, and have adjudged them to be dangerous to the city of South Houston. We recognized the lower unit of Government's order. That was all we had to do, and we did it, but it was on account of the city ordinance with reference to a fire hazard.

Mr. Allison:

You have the same power, and a higher power than they have. Here is the thing that should be kept in mind the effect of the order of the Commission in the drilling of unnecessary wells, is the same as the confiscation of property.

Col. Thompson:

Whose property is being confiscated. We have not done anything like that.

Mr. Allison:

This drilling of unnecessary wells is the same.

841 Mr. Tilley:

I don't think it is my province to tell you what the law is. I think you have a most competent Attorney General to tell you what the law is. We most vigorously urge no inhibitions or prohibitions which will keep this Commission from adjusting the allowable for all of East Texas. It is not acreage production. It is a combination

of those factors which if used by this Commission and might have been used in the other fields, and if used in this field, will give an allocation of the allowable in this field.

### Certification.

The State of Texas,  
County of Travis.

I, a Notary Public in and for Travis County, Texas, hereby certify that I have compared and found the foregoing writing to agree and be a true verbatim copy of, and the whole of, the Transcript of Testimony taken at the Statewide Proration Hearing held by the Railroad Commission of Texas on May 17, 1938, in Austin, Texas, as is on file in the offices of the Railroad Commission of Texas in Austin, Texas.

Given under my hand and Seal of Office on this, the 21 day of May, A. D. 1938.

(Signed)

EMMA RUTH HAMNER,

(Seal)

Notary Public, Travis County,  
Texas.

842 Before the Railroad Commission of Texas.  
Oil and Gas Division.

In the Matter of: Application of Rowan & Nichols Oil Company for adjustment in allowable and, alternatively, for twenty permits as exceptions to Rule 37.

No. 23,545 and East Texas Proration Docket No. ....

Comes now Rowan & Nichols Oil Company, applicant in the above styled and numbered application, heretofore filed with the Railroad Commission of Texas on February 24, 1938, and moves that the action of the Railroad Comi-

mission of March 17, 1938, in denying applicant's request for an adjustment in the allowable of what is known as its Todd "B" lease, consisting of 24.99 acres, Castleberry Survey, Gregg County, Texas, and denying its alternative request, in the event said applicant had no lawful right to an adjustment of allowable, for twenty permits to drill wells as an exception to Rule 37 on said lease, and the granting of only its application for Well No. 6 as an equidistant offset to the R. M. Wood Well No. 1, Wood Fee, Castleberry Survey, Gregg County, be set aside and held for naught, for the following good and sufficient reasons:

#### I.

Applicant has drilled and is producing five wells on said lease, in accordance with the rules, regulations and orders of the Railroad Commission.

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#### II.

Said lease is located in what is known as the Glade-water Nose, and the "fairway," with an average sand thickness underlying said lease of one hundred (100) feet, and an average potential per well on said lease of 964 barrels, and with a present allowable on said lease for all five wells of 112 barrels per day.

#### III.

Taking into consideration the elements of porosity, permeability, oil saturation, and thickness of sand underlying said lease, applicant is not receiving and does not have an opportunity equal to other operators and lease owners in the field, to recover its fair share of the oil.

#### IV.

Applicant is entitled to that proportion of the total daily allowable for the East Texas Field as the recoverable

oil under its lease bears to the total recoverable oil in the East Texas Field, but under the present proration orders and the basis therefor, applicant is being deprived of said equal opportunity without due process of law, and is not receiving the equal protection of the laws guaranteed to it by the Constitution and laws of the State of Texas and of the United States.

## V.

Applicant can produce from the wells now producing on its lease without waste, that proportion of the total daily allowable that the recoverable oil under its lease bears to the total recoverable oil in the East Texas Field, without the necessity of drilling additional wells.

## VI.

The granting of its application for Well No. 6, and the production of oil therefrom, under the present basis of proration, will continue to deprive and does not grant and will not guarantee to applicant an equal opportunity to recover its fair share of the oil, and results in the Railroad Commission's depriving applicant of producing per day that proportion of the daily allowable that the total recoverable oil under its lease bears to the total recoverable oil of the East Texas Field, unjustly, inequitably, and contrary to the Constitution and laws of the State of Texas and the United States.

Wherefore, applicant prays that this motion for rehearing be granted, that the order of the Commission heretofore entered on March 17, be set aside and held for naught, and that upon rehearing, the statewide proration order made by said Commission on the 22nd day of March, 1938, on hearing held at Austin on March 19, 1938, be set aside

and re-entered or amended so as to give applicant the relief sought at said hearing.

It is also most respectfully urged and prayed that in view of the litigation pending involving, and various claims to, the title to the southern part of applicant's lease and the bona fide title dispute that R. M. Wood claims exists, the Railroad Commission inform this applicant just where the Well No. 6 granted to applicant would be.

Respectfully submitted,  
RICE M. TILLEY,  
PHILLIP TOCKER;

Attorneys for Applicant,  
Rowan & Nichols Oil  
Company.

045

## EXHIBIT 5.

Schedule of Allowable Production in the East Texas Oil Field According to Proration Schedule Dated January 1, 1939.

No. wells less than 20 bbls. daily .....	463
No. wells, 20 bbls. but less than 21 .....	21,179
No. wells, 21 bbls. but less than 22 .....	2,000
No. wells, 22 bbls. but less than 23 .....	1,831
No. wells, 23 bbls. but less than 24 .....	319
No. wells, 24 bbls. but less than 25 .....	96
No. wells, 25 bbls. or over .....	22
Total wells .....	25,910

## EXHIBIT 6.

Allowable .....	522.591 Bbls.
Sub-Marginal wells—463 .....	
Allowable—do .....	5.395
Net Prorated Allowable .....	517.196
No. Wells .....	25,910
Sub-Marginal .....	463
	<hr/>
	25,447
25447 wells @ 20 Bbls.= .....	508,940
Bbls. to be allotted to Potential = .....	8,256
Percentage of Potential Allotment to Net prorated Allowable = .....	1.61%

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## EXHIBIT 13.

Railroad Commission of Texas.

Oil and Gas Division.

Oil and Gas Docket No. 120.

In Re: Conservation and prevention of waste of crude oil  
and natural gas in the East Texas field, in Upshur,  
Gregg, Rusk, Smith and Cherokee Counties, Texas.

Austin, Texas, March 9, 1933.

Special Order Adopting Rules and Regulations Governing  
Production of Crude Oil in Said Field Following  
Hearing on February 23rd and 24th, 1933.

This Commission having considered evidence adduced at  
hearing held in above cause on February 23rd and 24th.

1933, as to the demand for crude oil from the East Texas Field and the method of distribution of the same to the wells or leases therein, and having considered all of the testimony adduced at said hearing and other previous hearings, and having considered all conditions existing in said field and all factors necessary to a proper determination of the allowable daily production of crude oil from said field during the next ninety (90) days and the distribution thereof, including bottom hole pressures, and permeability and porosity reflecting the capacity of a well to produce, and sand thickness, which takes into account the position of the well on the structure, is of the opinion and so finds that to prevent waste and to bring the production of said field more nearly in conformity with the actual demand for crude oil from said field and secure a more orderly and equitable production program therein, the daily allowable production thereof should be limited and regulated as hereinafter appears.

847. Therefore, it is Ordered by the Railroad Commission of Texas that effective at seven o'clock A. M., March 10, 1933, and continuing until 7 o'clock A. M., June 1, 1933, unless sooner changed by order of this Commission, based on other findings of fact which may be ascertained by it, as to market demand or waste as defined by law, Rule 27 as adopted by previous order is hereby changed so as to hereafter read as follows:

Rule 27. For the period indicated above, the aggregate production of all wells in the East Texas field, as defined by orders heretofore entered governing the same, shall not exceed Four Hundred Thousand (400,000) barrels of crude oil daily. The Commission, through its agents in the field, will issue schedules effective at seven o'clock A. M., on the 19th day of March, 1933, and on the first days of April and May, 1933, to govern production of each and every lease

or property therein during said months according to a combined bottom hole pressure, sand thickness, and per well allowable basis as follows:

(a) Forty barrels per well shall first be allotted to all marginal wells.

(b) The remainder of the aggregate allowable production for the entire field as above fixed, after deducting the marginal well allowance, which remainder will hereafter be called "proratable allowable," shall be allotted to all wells in the field as follows: For the schedule for

each period above defined the daily well allowable shall be computed as follows: The Commission

or its duly accredited agents in the field, effective at the beginning of each period shall ascertain the number of wells capable of producing oil, as of the first day of such period and the sum of the total wells capable of producing oil on the first day of each period, plus the probable completion during such period, shall be divided into one-third (1/3) of the proratable allowable. The quotient resulting therefrom shall be the daily well allowable for such period, and each well shall be entitled to produce during such period its daily well allowable so computed plus the amount provided for in Paragraph (c) hereof.

(c) The other two-thirds (2/3rds) of the proratable allowable shall be allotted to wells in said field in accordance with the following scale:

Allotment basis  
pressure:

1000 lb. equals 9 bbls.

1100 lb. equals 10 bbls.

1200 lb. equals 11 bbls.

1300 lb. equals 12 bbls.

Allotment basis  
sand thickness:

20 ft. equals 9 bbls.

40 ft. equals 10 bbls.

60 ft. equals 11 bbls.

80 ft. equals 12 bbls.

1400 lb. equals 13 bbls.

1500 lb. equals 14 bbls.

100 ft. equals 13 bbls.

Illustrative Scale for application of above allotments.

1 well 1000 lb. pressure	20 ft. sand equals 30.8 bbls.
1 well 1100 lb. pressure	20 ft. sand equals 31.8 bbls.
1 well 1200 lb. pressure	20 ft. sand equals 32.8 bbls.
1 well 1200 lb. pressure	40 ft. sand equals 33.8 bbls.
1 well 1300 lb. pressure	40 ft. sand equals 34.8 bbls.
1 well 1300 lb. pressure	60 ft. sand equals 35.8 bbls.
1 well 1400 lb. pressure	60 ft. sand equals 36.8 bbls.
1 well 1400 lb. pressure	80 ft. sand equals 37.8 bbls.
1 well 1400 lb. pressure	100 ft. sand equals 38.8 bbls.
1 well 1500 lb. pressure	20 ft. sand equals 35.8 bbls.
1 well 1500 lb. pressure	40 ft. sand equals 36.8 bbls.
1 well 1500 lb. pressure	60 ft. sand equals 37.8 bbls.

Agents of the Commission will secure representative bottom hole pressure data uniformly throughout said field in such manner as the Commission may direct; will divide the field into pressure zones, and estimate the average pressure of the field.

Sand thickness shall be ascertained by agents of the Commission for the purpose of application of the formula hereinafter adopted in such manner as the Commission may direct.

Until the necessary data can be assembled and the above plan of distributing the aggregate daily allowable production from said field made effective March 19, 1933, no well in said field shall produce in excess of Thirty-six (36) barrels per day.

The allowable production for each lease or separate property shall be the aggregate production of all wells therein.

850 All existing general and special orders governing said field not in conflict with the terms of this order are hereby readopted and all of the terms of such orders in conflict herewith are hereby annulled.

It is Further Ordered that any interested party who is dissatisfied with this order or with the administration thereof, shall notify the Commission, through its Chief Supervisor at Austin, Texas, or its Deputy Supervisor in said field in writing so that the Commission may, if the facts and the law so justify, take such action as will satisfy the complaining party.

If any operator in said field shall have reason to believe that the Commission has made an error in the measurement and calculation of the bottom hole pressure and or sand thickness of his well or wells, it shall be the duty of such operator to make known to the Commission, the alleged error, whereupon the Commission will make correction of such error if and when it has had satisfactory proof thereof, consisting of the true measurements or calculations made in collaboration with or under the supervision of agents of the Commission, or such other persons as the Commission may designate, the service of such agents or others to be furnished or designated by the Commission upon written request therefor.

This cause is hereby held open upon the Commission's docket for the adoption of such supplemental or amendatory orders as in the Commission's judgment may be required under evidence adduced in hearings herein.

RAILROAD COMMISSION OF  
TEXAS.

(Seal)

By C. V. TERRELL,

Commissioner.

ERNEST O. THOMPSON,

Commissioner.

Attest:

C. F. PETET, Secretary.

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## EXHIBIT 14.

State of Texas,  
Railroad Commission of Texas,  
Austin.

Rec'd. Mar. 20, 1938.

#6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22,  
23, 24, 25 B. C. Todd et al.

Wm. H. Castleberry Survey, Gregg County, Texas.

Case No. 25,545.

Rule 37.

Applicant: Rowan & Nichols, 903 Trinity Life Building,  
Fort Worth, Texas.

The application of Rowan & Nichols for an exception under the provisions of Rule 37, coming on to be heard on the 11th day of March, 1938, by the Railroad Commission of Texas, and it appearing that the petition shows good cause; that no injustice will be done by the granting of such exception, and that same should be granted to prevent confiscation of property:

Now, Therefore, it is Ordered, that the application of Rowan & Nichols for an exception under the provisions of Rule 37 and a permit to drill well No. 6, B. C. Todd et al Lease, containing 25 acres of land out the Wm. H. Castleberry Survey in Gregg County, Texas, as shown by

plat submitted, is hereby approved and applicant is granted permission to drill well No. 6 to be spaced as follows:

As a direct northwest and equidistant offset to R. M. Wood No. 1, fee.

It is Further Ordered that all other requests are hereby denied.

Entered at Austin, Texas, on this the 17th day of March, 1938.

C. V. TERRELL,  
Chairman.

LON A. SMITH,  
Commissioner.

.....  
Commissioner.

Attest:

C. F. PETET,  
Secretary.

The above and foregoing is a true and correct copy of an order of the Railroad Commission of Texas, entered on the above date.

(S.) LATEN STANBERRY, j.  
Chief Supervisor, Oil and  
Gas Division.

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State of Texas.  
Railroad Commission of Texas,  
Austin.

Motion for Rehearing by Tilley and Tocker, Attorneys for  
Rowan and Nichols Oil Company, Applicant.

Rec'd. Apr. 8, 1938.

Case No. 25,545.

Rule 37.

Applicant: Rowan & Nichols Oil Company, 903 Trinity  
Life Building, Fort Worth, Texas.

Motion for rehearing in the above numbered case having this date been considered by the Railroad Commission of Texas, and it appearing that the reasons set out in said motion are sufficient to justify the granting of a rehearing covering the application of Rowan & Nichols Oil Company for an adjustment of allowable or in lieu thereof, special permit to drill wells Nos. 7 to 25 inclusive on the B. C. Todd et al lease, containing 25 acres of land out of the Wm. H. Castleberry Survey in Gregg County, Texas;

Now, therefore, it is Ordered that the motion for rehearing filed by Tilley and Tocker, Attorneys for Rowan & Nichols Oil Company, applicant in the above numbered case, is hereby granted.

Entered at Austin, Texas, on this the 31st day of March, 1938.

C. V. TERRELL,  
Chairman.

LON A. SMITH,  
Commissioner.

ERNEST O. THOMPSON,  
Commissioner.

Attest:

C. F. PETET,  
Secretary.

The above and foregoing is a true and correct copy of an order of the Railroad Commission entered on the above date.

(S.) LATEN STANBERRY,

Chief Supervisor, Oil and  
Gas Division.

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855

EXHIBIT 16.

6

Railroad Commission of Texas.  
Oil and Gas Division.

In Re: Conservation and Prevention of Waste of Crude  
Petroleum and Natural Gas in the State of Texas.

Oil and Gas Docket Nos. 108, 120, 123, 124, 125, 126, 128,  
129, 132 & 146.

=20 - 397.

Austin, Texas, August 29, 1938.

Special Order Fixing the Allowable Production of Crude  
Oil in the Various Fields and Districts in Texas.

Whereas, after due notice, hearings have been held in Austin, Texas, at various times, including the hearing on August 19, 1938, with respect to the existence and imminence of waste of oil and gas in the State of Texas, and the prevention thereof; and

Whereas, in view of the evidence, including among other matters the physical conditions in the various fields, the transportation and marketing facilities, the reasonable market demand, the reasonableness of the allocation as between fields of the allowable production under previous orders; and

Whereas, The Railroad Commission of Texas finds from the evidence that the reasonable market demand for oil produced in this State from the various fields and districts therein equals the amount hereinafter shown as the allowable production thereof during the period beginning at 7 o'clock a. m., September 1, 1938, and until further ordered; and

Whereas, The Railroad Commission of Texas finds that waste exists and is imminent and that to prevent such waste of oil and gas as the same is defined by the applicable Statutes, it is necessary to restrict the production of oil in the State of Texas to the reasonable market demand:

Therefore, it is Ordered that beginning at 7 o'clock a. m., September 1, 1938, and until further ordered, the production of oil in the State of Texas and the various fields shown, shall be as hereinafter shown Except as provided for in the Commission's order of August 29, 1938, entitled "General Order Shutting Down All Oil Wells in the Various Fields and Districts in the State of Texas on September 3rd, 4th, 10th, 11th, 17th, 18th, 24th and 25th.

Rule 2 of Division 2, as contained in an order of this Commission dated October 17, 1933, pertaining to the Panhandle District of Texas is hereby re-adopted and amended as follows:

Rule 2. Not more than Eighty Thousand Seven Hundred Sixty-three (80,763) barrels of crude oil shall be produced from said district during any day of the effective period of this Order. Moore County shall not produce in excess of One Thousand Five Hundred Twenty-nine (1529) barrels daily. Moore County allowable is in addition to Panhandle allowable. The Osborne Area

in Wheeler County shall not produce in excess of Six Hundred Twenty (620) barrels of crude oil daily. The Osborne Area allowable is in addition to the Panhandle allowable.

2. Rule 23 (a) of Division 3, as contained in an order of this Commission dated October 17, 1933, pertaining to the East Texas Field is hereby re-adopted and amended as follows:

857       Whereas, The Railroad Commission of Texas finds from evidence submitted to it at a hearing held in Austin on August 19, 1938, and at previous hearings held before the regulatory body that the reservoir of the East Texas Field has its energy supplied by a hydrostatic drive which encroaches from the west to the east, and only a certain amount of crude oil can be withdrawn daily from the East Texas Reservoir in order to utilize to the greatest extent the energy necessary for the production and recovery of the greatest amount of oil ultimately from the reservoir. It has been recommended to the Commission by competent engineers that not more than 425,000 to 450,000 barrels of crude oil should be allowed to be produced from the East Texas Reservoir in any one day in order that the reservoir might be depleted with the least possible amount of waste incurring. Evidence has also been submitted to the Commission at these hearings that the production of from 425,000 to 450,000 barrels of crude oil will prohibit the coning of water, the uneven encroachment of water, and the subsequent trapping of much oil with otherwise, under higher daily allowables of crude oil, would not be recovered.

Rule 23 (a). Therefore, it is Further Ordered by the Railroad Commission of Texas that during each twenty-four (24) hour period beginning at 7 o'clock a. m., Cen-

tral Standard Time, September 1, 1938, the owner or operator or manager of each well in the East Texas Field shall be permitted either collectively or individually, to produce daily from each well, a maximum of Two and Thirty-two Hundredths (2.32%) Per Cent of its hourly potential capacity as determined by the Commission.

3. Rule 2 of Division 5, as contained in an Order of this Commission dated October 17, 1933, pertaining to the North Texas District is hereby re-adopted and  
858 amended as follows:

Rule 2. Not more than Eighty-eight Thousand and Eight (88,008) barrels of crude oil shall be produced from said district during any day of the effective period of this order, which is distributed in the following manner:

North Texas Proper, Anderson-Kerr, 65,747.  
Gant Pool, 340.  
Foard County, 688.  
K. M. A., 21,233.

4. Rule 2 of Division 6, as contained in an order of this Commission dated October 17, 1933, pertaining to the West Central Texas District is hereby re-adopted and amended as follows:

Rule 2. Not more than Seventy-nine Thousand and Sixty-seven (79,067) barrels of crude oil shall be produced from said district during any day of the effective period of this order, which is distributed to the various counties as follows:

Brown .....	2086	McCullough .....	25
Callahan .....	1450	Palo Pinto .....	370
Coleman .....	1217	Reagan (Big Lake)...	7500

Comanche .....	79	Reagan (Grayson)...	151
Crockett (Crockett)...	266	Runnels .....	147
Crockett (Todd) .....	0	Shackelford .....	7396
Crockett (Simpson) .....	50	Stephens .....	4393
Crockett (World) .....	1047	Stonewall .....	100
Eastland .....	2973	Taylor .....	74
Erath .....	76	Throckmorton .....	399
Irion .....	40	Upton (McCamey)...	19662
Fisher .....	4215	Upton (Herrington Ex-	
Haskell .....	227	tension) .....	196
Hurdle .....	245	Webb Ray .....	79
Jack (So. Half) .....	9939	Young (So. Half) .....	7401
Jones .....	7264		

Rule 4 of Division 7, as contained in an order of the Commission dated October 17, 1933, pertaining to the West Texas District is hereby readopted and amended as follows:

Rule 4. Not more than Two Hundred Twenty Three Thousand Five Seventy Eight (223,578) barrels of crude oil per day shall be produced from said district during any day of the effective period of this Order, which shall be distributed to the various fields therein as follows:

Pashara .....	176	McClintic .....	1211
Bennett .....	2978	Monroe .....	24
Carter .....	20	Moore .....	80
Church Fields .....	6633	Netterville .....	378
Cowden, North .....	8735	Northwest .....	39
Cowden, South .....	347	Parker .....	33
Cowden, Crane .....	2357	Payton .....	1216
Dean .....	80	Pecos Valley .....	993
Deep Rock .....	236	Penwell .....	4710
Dobbs .....	9	Richards .....	0
Duggan .....	518	Sand Hills (Permian) .....	1293

Edwards	10	Sand Hills (Ordovic-	
Emperor	1558	ian)	260
Estes	8510	Scanlan	0
Evans	371	Scarborough	2075
Foster	6526	Sealey	503
Fuhrman	1554	Seminole	511
Garza County	41	Shearer	98
Goldsmith	21812	Shipley	1688
Gulf-McElroy	4422	Slaughter	683
Halley	559	Snyder	1486
Harper	11954	Taylor-Ling	1300
Hendricks	12000	Tobarg	2048
Henderson	3500	Waddell	1469
Howard-Glasscock	17773	Ward, North	6706
Iatan-E. Howard	7807	Ward, Sough	12320
Johnson	43	Wasson	7828
Jordan	2586	West	60
Kermit	20074	Westbrook	922
Keystone	3365	Wheat	1527
Leck	340	White-Baker	0
Mason	395	Wilson	0
Masterson	618	Yates	21072
Means	2988	Yates (Smith Sand)	150

6. Rule 2. of Division 4, as contained in an order of this Commission dated October 17, 1933, pertaining to the East Central Texas District is hereby readopted and amended as follows:

Rule 2. Not more than One Hundred Twelve Thousand One Hundred Sixty Three (112,163) barrels of crude oil per day shall be produced from said field in said district during any day of the effective period of this order. Said amounts shall be allocated to the various fields in the following amounts:

Boggy Creek	450	Post Oak	10
Bolivar	28	Powell	2163

Cayuga .....	11059	Potter .....	162
Collinsville .....	10	Percilla .....	24
Corsicana Shallow ...	435	Richland .....	25
Curry .....	122	Rodessa .....	31996
Flag Lake .....	583	Rusk .....	92
Ginter .....	50	Sulphur Bluff .....	6205
Grapeland .....	100	Shelbyville .....	30
Huntington .....	18	South Bosque .....	18
Lone Star .....	..	Talco .....	33,661
Long Lake .....	2787	Trinity .....	757
Lott .....	70	Van .....	18725
Mexia .....	1948	Van Shallow .....	142
Navarro Crossing ....	200	Waskom .....	114
Opelika .....	30	Wortham .....	85
Panola .....	47	Wortham (Shallow)...	72
Pottsboro .....	5		

7. Rule 2 of Section "A" of Division 8, as contained in an order of this Commission dated October 17, 1933, pertaining to the Southwest Texas District is hereby re-adopted and amended as follows:

Rule 2. Not more than Two Hundred Ninety Two Thousand Eight Hundred Five (292,805) barrels of crude oil shall be produced in said district during any day of the effective period of this order and same shall be distributed as follows:

#### Division I.

Alta Vista .....	4	Hantho-Nelson .....	0
Bateman .....	135	Hilbig .....	396
Batesville, New .....	5	Jacobs .....	616
Berlin, New .....	0	Jones .....	3
Bob Rose .....	10	Kimbrow .....	11
Buchanan .....	240	Larremore .....	81
Burdett Wells .....	38	Loma Alto .....	115

Calliham .....	215	Lost Mule .....	0
Carroll .....	60	Luling Branyon .....	11857
Carver-Kallison .....	143	Lytton Springs .....	342
Cedar Creek .....	29	Manford .....	22
Cedar Creek No. ....	39	Matthews .....	24
Chapman-Abbott ....	252	Minerva Rockdale ....	200
Chicon Lake .....	21	Noack .....	89
Clark .....	145	Pearsall .....	693
Darst Creek .....	9011	Salt Flat .....	5107
Deupree .....	41	Somerset .....	674
Dale .....	171	Southton .....	64
Dale, West .....	230	Spiller .....	64
Dunlap .....	180	Staples .....	1
Dunlay .....	39	Riddle .....	148
Eckert .....	159	Taylor Ina .....	8
Ellison-Young .....	155	Thrall .....	39
Ezzell .....	4507	Von Ormy .....	193
Espada, Mission .....	1	Von Ormy .....	75
Fairfield .....	7	Walnut Creek .....	48
Gas Ridge .....	8	Zoboroski .....	137

## Division II.

Burnell, South .....	1099	Mt. Lucas .....	69
Caesar .....	324	Normanna .....	45
Colletto Creek .....	619	Oakville .....	138
Cordeil .....	588	O'Connor McFadden ..	248
Diamond Half .....	477	Pettus .....	835
Dinero .....	77	Pettus New .....	1164
Dirks .....	2679	Placedo .....	9493
East Tolfner .....	120	Placedo, East .....	392
Ganado .....	44	Plummer .....	286
Greta .....	8294	Port Lavaca .....	58
Greta Deep .....	361	Ray .....	438
Heyser .....	11300	Refugio-Fox .....	843
Holzmark .....	34	Refugio-New .....	3977

Hordes Creek	49	Refugio-Old	1515
Keeran	611	Sarco	0
McMurray	4	Stack	10
McFadden	1568	Tom O'Connor	15538
McNeil	82	Tuleta	502
Mauritz	176	Vanderbilt	73
Mineral	0	Voss	25

## Division IV.

Agua Dulce	47	London	75
Albercas	61	Loma Novia	15253
Alfred	278	Lopez	7225
Alice	2058	Los Olmos	125
Alta Mesa	668	Loma Vista	10
Alta Verde	12	Luby	7128
Angelita	21	Lundell	476
Aransas	7429	Midway	1028
Aviators	371	Mirando City	455
Baldwin	472	Mirando Valley	278
Barbacoas	9	Moca	446
Benavides	13665	Nelson	17
Bruni	605	O'Hern	7704
Bruni East	345	Oilton	2867
Captain Lucey	271	Las Animas	75
Carolina-Texas	8	Peters	132
Casa Blanca	611	Piedre Lumbre	1296
Chapman	74	Piedras Pintas	2
Charamousca	342	Plymouth	13305
Charco-Redondo	14	East Premont	264
Clara Driscoll	1523	Premont Prospect	702
Clara Driscoll So.	667	Rancho Solo	16
Cole Middle	20	Randado	327
Cole West	457	Ricaby	7
Colmena	362	Richard King	472
Colorado	319	Rio Grande City	110
Comitas (Haynes)	743	Rincon	98

Corpus Christi .....	4553	Roma .....	1
Cuellar .....	115	Sandia .....	13
Driscoll .....	1397	Sarnosa .....	768
Eagle Hill .....	424	Sam Fordyce .....	3566
El Tanque .....	268	Sam Fordyce North..	343
Escobas .....	1418	Saxet .....	19893
Fitzsimmons .....	612	Saxet Frio .....	20647
Flour Bluff .....	5927	Seven Sisters .....	8874
Govt. Wells No. ....	8810	Seven Sisters So....	594
Govt. Wells So. ....	4725	Sinton .....	8
Henne-Winch-Farris..	14	Stratton .....	410
Guerra .....	837	Sullivan .....	108
Hoffman .....	3692	Sweden .....	286
Jennings .....	1068	Taft .....	2766
Killam .....	1352	Tesoro .....	196
Kingsville .....	69	Thomas Lockhart ....	5
Kohler .....	114	Turkey Creek .....	3708
Kohler Deep .....	51	White Point .....	28
Labbe .....	320	White Point East ....	1960
Laurel .....	11		

8. Rule 2 of Section A, Division 9, as contained in an Order of the Commission dated October 17, 1933, pertaining to the Gulf Coast District is hereby readopted and amended as follows:

Rule 2: Not more than Two Hundred Fifty Four Thousand Eight Hundred Thirteen (254,813) barrels of crude oil shall be produced from said field of said district during any day of the effective period of this order, which shall be distributed as follows:

Allen Dome .....	12	Lost Lake .....	135
Amelia .....	4399	Louise .....	1560
Anahuac .....	9832	Lovell's Lake .....	127
Ariola .....	564	Livingston .....	2362

Armour .....	167	Magnet .....	1194
Bammel .....	98	Manvel Miocene .....	5884
Barson .....	1136	Manvel Oligocene .....	5445
Batson New .....	1118	Markham .....	1922
Barbers Hill .....	10762	Mykawa .....	200
Bay City .....	2726	Mykawa New .....	1447
Big Creek .....	728	Nash Dome .....	-0-
Big Hill .....		Nome .....	1764
Blue Ridge .....	802	North Dayton .....	120
Boling .....	2010	Old Ocean .....	5328
Brenham .....	35	Orange .....	697
Brookshire .....	10	Orange West .....	1080
Buckeye .....	196	Orchard .....	350
Call .....	49	Palacios .....	120
Cedar Point .....	457	Pickett Ridge .....	1620
Cheek .....	106	Port Neches .....	1274
Clam Lake .....	98	Port Neches West .....	148
Clay Creek .....	663	Pierce Junction .....	5216
Cleveland .....	450	Raccoon Bend .....	1598
Clinton .....	468	Raccoon Bend (Cock-	
Conroe .....	39368	field) .....	2460
Cotton Lake .....	645	Rockland .....	
Cotton Lake So. ....	1157	Sandy Point .....	385
Damon Mound .....	366	Saratoga .....	1008
Danbury Dome .....	588	Satsuma .....	364
Dickinson .....	5275	Schwab .....	78
Esperson Dome .....	1608	Seabreeze .....	226
Eureka Heights .....	1101	Segno .....	2211
Fairbanks .....	4131	Segno Deep .....	150
Fannet .....	719	Shepherd's Mott .....	-0-
Gillock .....	3744	Silsbee .....	2166
Goose Creek .....	2075	Sour Lake .....	1491
Greens Lake .....	19	South Houston .....	3861
Hamman .....	1976	South Liberty .....	673
Hankamer .....	1328	Spindletop .....	2926
Hankamer New .....	264	Sugarland .....	3994
Hardin .....	5488	Thompsons .....	13108

Hardin West .....		Tomball .....	8924
Hastings .....	24333	Turtle Bay .....	1430
High Island .....	2690	Webster .....	3763
Hitchcock .....	686	West Beaumont .....	1728
Hull (Old) .....	3376	West Columbia .....	2186
Hull (New) .....	7640	West Columbia New..	3618
Humble .....	4362	West Columbia Vicks.	39
Joe's Lake .....	1070	Wilson .....	73
Kubela .....	702	Willow Slough .....	381
LaBelle .....	20	Withers .....	3787
Lochridge .....	2575		

It is Further Ordered that allowable oil in the foregoing Order is measured on 100 per cent tank tables according to the Pipe Line Rule Number Nine (9), and corrected to sixty (60) degrees Fahrenheit.

It is Further Ordered that this Cause be held open on the Docket for such further orders as may be necessary and supported by evidence of record in the above Cause.

RAILROAD COMMISSION OF  
TEXAS,

C. V. TERRELL, Chairman,  
ERNEST O. THOMPSON,  
Commissioner.

(Seal)

Attest:

C. F. PETET, Secretary.

## EXHIBIT 17.

Railroad Commission of Texas.

Oil and Gas Division.

Oil and Gas Docket No. 120. .

In re: Conservation and Prevention of Waste of Crude  
Oil and Natural Gas in the East Texas Field.

Austin, Texas, May 29, 1934.

Pursuant to notice and hearing in the adoption and amendment of rules and regulations by the Railroad Commission of Texas governing the conservation of crude oil and natural gas and the prevention of waste thereof, and in the light of evidence heretofore introduced at hearings held pursuant to such notices:

It is Hereby Ordered by the Railroad Commission of Texas that Rule No. 1 of Sub-division II (Drilling) of Division 3, being special rules governing the East Texas Field, is hereby amended so as hereafter to read  
866 as follows:

Rule 1. Spacing Rule. No well for oil or gas shall hereafter be drilled in said East Texas Field nearer than 660 feet to any other completed or drilling well on the same or adjacent tract or farm; and no well shall be drilled in said field nearer than 330 feet to any property line, lease line or subdivision line; provided that the Commission in order to prevent waste, or to prevent the confiscation of property will grant exceptions to permit drilling within shorter distances than above prescribed whenever the Commission shall determine that such exceptions are necessary either to prevent waste or to prevent the confiscation of property. When an exception to such rule

is desired application therefor shall be filed with the Commission fully stating the facts, which application shall be accompanied by a plat drawn to the scale of one inch equalling four hundred feet, accurately showing to scale the property on which permit is sought to drill a well under an exception to this rule, and accurately showing to scale all other completed, drilling, and permitted wells on said property; and accurately showing to scale all adjacent surrounding properties and wells. Such application shall be verified by some person acquainted with the facts, stating that all facts therein stated are within the knowledge of the affiant true, and that the accompanying plat is accurately drawn to scale and correctly reflects all pertinent and required data. Such exception shall be granted only after at least ten days notice to all adjacent lessees affected thereby has been given, and after public hearing at which all interested parties may appear and be heard, and after the Commission has determined that an excep-

tion to such rule is necessary either to prevent  
 867 waste or to protect the property belonging to applicant from confiscation. All pending applications shall be amended to conform to this rule before being acted upon.

No well drilled in violation of this rule without special permit obtained in the manner prescribed in said rule, and no well drilled under such a special permit which does not conform in all respects to the terms of such permit, shall be permitted to produce either oil or gas; and any such well so drilled in violation of said rule or in violation of a permit granted as a special exception to said rule shall be plugged.

The order entered by this Commission on August 30, 1933, commonly designated as the direct and equidistant offset order is hereby rescinded, annulled and shall be of

no further force and effect. All other rules, regulations and orders of this Commission which conflict with the terms and provisions of Rule No. 1 as hereby amended and promulgated are hereby declared to have no further application to wells in said East Texas Field to the extent of such conflict.

In the adoption and promulgation of this order it is hereby declared that the Commission intends to adopt each phrase, sentence, and paragraph separately and independently of each other such phrase, sentence, and paragraph, and if any portion of this order or any portion of the rule hereby adopted shall be declared invalid, such declaration and such invalidity shall not affect any other portion.

RAILROAD COMMISSION OF  
TEXAS,

By LON A. SMITH,  
Chairman,

C. V. TERRELL,  
Commissioner,

ERNEST O. THOMPSON,  
Commissioner.

Attest:

C. F. PETET,  
Secretary.

(Seal)

## EXHIBIT 18.

Railroad Commission of Texas.

Oil and Gas Division.

Oil and Gas Docket No. 120.

Austin, Texas, April 22, 1933.

In Re: Soncervation and Prevention of Waste of Crude Oil  
and Natural Gas in the East Texas Field:-

Special Order Promulgating Certain Rules and Regulations for the East Texas Field and Allocating to the Various Wells Therein the Maximum Amount of Oil to be Produced From Such Field:

Whereas, on the 3rd day of April, 1933, the Railroad Commission of Texas, hereinafter called Commission, held a hearing at Austin, Texas, for the purpose of determining what rules and or orders should be promulgated for the purpose of preventing, insofar as possible, waste of oil, gas, gas energy and other propulsive forces tending to aid in the extraction of oil and other natural resources of the State of Texas existing in the oil and gas producing area in Rusk, Gregg, Smith, Upshur, and Cherokee Counties, Texas, or extensions of such area, wherever located; and

Whereas, The Commission has deemed it necessary and advisable to consider and determine the actual and comparative productive capacity of each of the more than ten thousand oil and gas wells in said counties above mentioned, the oil producing area therein constituting what is commonly known and referred to as the East Texas Oil Field; and

Whereas, the Commission has tested or caused to be tested under its supervision, a sufficient number of "key wells" in said field to determine the facts mentioned in the last preceding paragraph, as well as other pertinent facts; and

Whereas, the Commission has not had sufficient time since the hearing above mentioned and since the making of the tests above mentioned to completely and thoroughly compile, study, analyze and assimilate the testimony adduced at the hearing, and the facts, data, and information obtained as the result of the making of the "key well" tests above mentioned; and

Whereas, the Commission deemed it necessary and for the best interests of the State and its citizenship and the various persons interested, directly or indirectly, in the production of oil in the East Texas Field that waste of the natural resources therein be prevented so far as possible, and for the purpose of permitting speedy elimination of such waste as might result from or occur despite the entry of this order, and in order that the Commission may make an adjustment of any discriminations and injustices arising or tending to arise under this order, and for the purpose of rechecking and, if necessary, reconsidering and correcting any errors, either of figures or judgment and discretion, the Commission makes, and enters the following temporary order, to become effective at 7 o'clock, A. M., Central Standard Time, April 24, 1933, and to continue in full force and effect until 7 o'clock, A. M., Central Standard Time, May 10, 1933, unless sooner vacated, changed, modified or amended, to-wit:

1. The Commission finds that the average hourly oil production capacity in barrels of 42 gallons each of each

well in said East Texas Field average over a period of twenty-four hours is as set out in the schedule hereto attached, marked Exhibit "A" and made a part hereof to the same extent and effect as if copied in full as the next succeeding paragraph hereof.

2. It is ordered that during each twenty-four hour period following 7 A. M. Central Standard Time, April 24, 1933, the owner or operator or manager of each well listed and set out in Exhibit "A" shall be permitted, either collectively or individually, to produce from such  
870 well a maximum of 15% of its average potential producing capacity as determined by the Commission and set forth in Exhibit "A." In no event shall any well in said area produce during the first twenty-four hours period above mentioned, or any successive twenty-four hour period, more than said 15% of its average hourly potential producing capacity.

3. The purpose of the Commission is to adopt and enforce a conservation order fair and equitable in its operation and to that end to provide such a method of allocating the production in the field as will recognize and give effect to the distinctive characteristics of the various wells in the field, so far as can be done. The Commission recognizes the difficulty of such task and that it is difficult, if not impracticable, to lay down in advance a general, inflexible rule governing the method of allocating the allowable that will in all cases give proper effect to actual differences in the productive capacity of different parts of the field and the various wells therein. Accordingly, as a part of the method of effecting the distribution of the Allowable, and for the purpose of and with the intent to make the distribution fair and equitable, it is provided, and the Commission hereby declares such to be its intent and desire, that the Supervisor in charge of said field, upon written application made by the owner or operator

or manager of any well or wells, or the duly authorized agent of either, may grant exception or exceptions to the order where such is necessary to do equity and prevent arbitrary and or unreasonable discrimination as between different wells in the field. No exception, however, shall be granted except upon written application to the Commission supported by the affidavit of one or more of the parties above mentioned, detailing the existence of all facts upon which the exception should be based and expressly affirming the bona fide belief on the part of the affiant that such facts exist; such exception or exceptions shall not take effect until approved by the Commission. The affidavit or affidavits above mentioned shall not be conclusive as to the existence of any or all of the facts therein detailed and the Commission shall be permitted to do any and all things reasonably necessary to affirmatively establish or refute the existence of such facts, and no exception shall be granted until and unless the Commission shall determine that the method of allocating the allowable does not give proper effect to actual differences in the productive capacity of the various wells; that is to say, no exception shall be granted except to better carry out the general purpose of the order, which is to conserve the natural resources existing in the East Texas Oil Field without discriminating against any one or more wells in the field in favor of any one or more wells in the field, but on the contrary to give proper recognition to actual differences in the productive capacity of each well in said field.

4. For the purpose of making necessary adjustments, if any, to eliminate arbitrary and unreasonable discrimination, the Commission hereby declares that upon proof that the finding of the average hourly potential of any well or wells in said field is erroneous to the extent of causing or tending to cause arbitrary and unreasonable discrimination, such orders will be entered as will eliminate such

discrimination; and in the event of the filing of application for exceptions as hereinabove provided and an adverse ruling thereon by the Commission and any Court of competent jurisdiction should thereafter, by final decree hold that the Commission erred in such ruling, the

Commission will readily enter its order and do  
 872 such other things in accordance with the mandate of such Court as are necessary to eliminate such discrimination.

5. It is further declared to be the intent and purpose of the Commission to consider each well in the field separately and individually and permit, without the necessity of changing this order as a whole, by such orders as may be necessary, the production from such well; of sufficient oil to recognize and give effect to the actual difference in the productive capacity of such well as compared to any other well or wells in the field.

Done at the City of Austin, this 22nd day of April, A. D. 1933.

RAILROAD COMMISSION OF  
 TEXAS.

By LON A. SMITH, Chairman.

C. V. TERRELL,

Commissioner.

(Seal)

ERNEST O. THOMPSON,

Commissioner.

Attest:

C. F. PETET, Secretary.

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## EXHIBIT 36.

Railroad Commission of Texas.

Oil and Gas Division.

Engineering Department.

Schedule Showing Irregular Levels at Which Woodbine  
Water is Produced in the East Texas Field.

Total Depth From To	No. of Wells	Percent of Total Wells	Cumulative Per Cent	Wells
3266 3270	41	1.35	1.35	41
3271 3275	39	1.28	2.64	80
3276 3280	67	2.21	4.84	141
3281 3285	97	3.19	8.04	244
3286 3290	158	5.20	13.23	402
3291 3295	174	5.73	18.97	576
3296 3300	232	7.64	26.61	808
3301 3305	380	11.49	39.13	1188
3306 3310	422	13.90	53.03	1610
3311 3315	536	17.66	70.69	2146
3316 3320	409	13.47	84.16	2555
<hr/>				
3321 3325	239	7.87	92.03	2794
3326 3330	146	4.81	96.83	2940
3331 3335	63	2.08	98.91	3003
3336 3340	33	1.09	100.00	3036

Total wells producing Woodbine water shown on  
Railroad Commission water report as of  
October 1, 1938 ..... 3746  
Total number of wells included in this report... 3036

Total wells not bracketed because of inadequate  
information (Some operators not knowing  
total depths of the older wells, and not hav-  
ing corrected elevations) ..... 710

Total wells producing Woodbine water above .....	3320—2555	=	84.16%
Total wells producing Woodbine water below .....	3320— 481	=	15.84%
	<hr/>		<hr/>
	3036	=	100.00%

The data for this report was obtained, compiled and computed from the total depths of wells making two per cent or more of Woodbine water as reported and sworn to by the operators in the East Texas Field.

ALBERT S. TRUBE,

Petroleum Engineer.

# EXHIBIT 37.

Mr. Rowan Claimed:	Per acre Foot
Original	60,000 bbls.
Now	46,000 bbls.

	At Fort Worth	Before Commission	Yesterday
Estimate of per-acre foot recoverable oil originally	45,000 (1933)	70,000 (1938)	60,000 (1939)
Percentage Inc. Over original Est.		55.5%	33.3%
Recoverable Oil for 24.99 Ac. Various Estimates	1,124,550 (14,332 pr. ac.)	1,749,300 (14,332 pr. ac.)	1,499,400 (14,332 per ac.)
Production to Jan. 1, 1939	358,159	358,159	358,159
This remaining According to Rowan's est.	766,391	1,391,141	1,141,241

Explain exponents of expansibility of East Texas crude, then show that he has as much recoverable oil as he originally had, less that lost by expansion: (Expansion factor for 500± drop):

	At Fort Worth	Before Commission	Yesterday
Est. Recoverable Oil ..	1,124,550	1,749,300	1,499,400
Factor 500± .....	.0046	.0046	.0046
Loss by Expansion ...	5,172	8,047	6,897
Has Produced .....	358,159	358,159	358,159
Loss by Expansion ...	5,172	8,047	6,897
Gain by Drainage ....	353,987	350,112	351,262

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## EXHIBIT 41.

Table Showing Estimate Rate of Abandonment of Oil Wells in East Texas Oil Field and Its Effect Upon Field Allowable Production.

Prior to 1935	20	Cumulative end of Year	Daily Allowable 20 Bbl. each
1935	3	23	460
1936	21	44	880
1937	73	117	2,340
1938	207	324	6,480
Estimated			
1939	250	574	11,480
1940	300	874	17,480
1941	340	1214	24,280

Estimated		Cumulative end of Year	Daily Allowable 20 Bbls. each
1942	390	1604	32,080
1943	425	2029	40,580
1944	470	2499	49,980
1945	520	3019	60,380
1946	560	3579	71,580
1947	600	4179	83,580
1948	650	4829	96,580
1949	700	5529	110,580

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## EXHIBIT 42.

## Density Data.

	No. Wells	Acres	Density (Acres per well)
1st Mile East .....	128	640	5
2nd Mile East .....	160	640	4
3rd Mile East .....	124	640	5.12
4th Mile East .....	34	160	4.70
Totals .....	446	2080	4.66
8 times folded .....	47	200	4.25
8 times circular .....	44	200	4.55
1 $\frac{1}{2}$ mile circular .....	106	502.6	4.51
3 $\frac{1}{4}$ mile circular .....	246	1130.9	4.49
1 mile circular .....	444	2010.6	4.53

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EXHIBIT No. 43—Order of R. R. Commission, dated 4 22 33 promulgating certain Rules and Regulations for the East Texas Field and allocating to the various wells therein the Maximum amount of Oil, etc., (same as Exhibit No. 18) omitted from the printed record, being heretofore copied at page 899.

## EXHIBIT 44.

Railroad Commission of Texas.

Oil and Gas Division.

Oil and Gas Docket No. 120.

In Re: Conservation and Prevention of Waste of Crude Petroleum Oil and Natural Gas in the East Texas Field.

Austin, Texas, January 31, 1933.

Supplemental Order Amending Special Order Fixing Rules and Regulations for the Prevention of Physical Waste of Crude Petroleum Oil and Natural Gas in What is Known as the East Texas Field Composed of Upshur, Smith, Rusk, Gregg and Cherokee Counties, Texas.

Whereas, the Railroad Commission of Texas, on February 25, 1932, adopted an order promulgating rules and regulations for the prevention of physical waste of crude petroleum oil and natural gas in what is known as the East Texas field composed of Upshur, Smith, Rusk, Gregg, and Cherokee Counties, Texas, and among other rules adopted for that purpose was the amendment of Rule 37 limiting the spacing of wells in said field, which amendment has been continuously kept in effect by subsequent orders; and

Whereas, it appears to said Commission that from evidence adduced at the East Texas hearing held in Austin, December 28 to 31, 1932, inclusive, said rule should be further amended, in order that properties might be more fully developed so as to insure a maximum oil recovery:

Therefore, it is hereby Ordered by the Railroad Commission of Texas that, effective as of the date hereof, Rule 1, Section (a) of said order of February 25, 1932, relating to the modification of Rule 37 be and the same is hereby amended so as to hereafter read as follows:

884        Rule 1: (a) Rule 37, adopted November 26, 1919, is hereby amended insofar as it applies to the East Texas Field so as to hereafter read as follows: "No well shall hereafter be drilled for oil or gas at any point less than six hundred and sixty (660) feet from any drilling or completed well; and no well shall hereafter be drilled for oil or gas at any point less than three hundred and thirty (330) feet from any property or division line; provided, however, the Commission in order to prevent waste or to protect vested rights, will, after hearing, grant exceptions permitting drilling within a less or shorter distance than hereinabove prescribed, upon application duly filed fully stating the facts, notice of such application and hearing having been first given to all adjacent lessees affected thereby; provided, that if all adjacent lessees affected thereby waive in writing, notice of hearing on or objection to the granting of said application, the Commission may proceed to determine such application without hearing; and, provided further that in cases of forced offsets the Commission may grant exceptions without waivers or hearing when it is evident that the wells desired are necessary to protect the properties on which it is proposed to drill them."

Section (b) and (c) of said order of February 25, 1932, and any or all other orders relating to spacing of wells on twenty (20) acre units and fractional units in said East Texas Field are hereby canceled.

RAILROAD COMMISSION OF  
TEXAS,

By LON A. SMITH,

Chairman,

C. V. TERRELL,

Commissioner,

ERNEST O. THOMPSON,

Commissioner.

Attest:

C. F. PETET,

Secretary.

(Seal)

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EXHIBIT 45.

Railroad Commission of Texas.

Oil and Gas Division.

Oil and Gas Dockets Nos. 108, 120, 123, 124, 125, 126,  
128, 129, 132 and 146.

In Re: Conservation and Prevention of Waste of Crude  
Petroleum and Natural Gas in the State of Texas.

Austin, Texas, September 27, 1935:

Special Rules Governing the East Texas Field.

The following rules shall govern the present producing areas and extensions thereof in the Counties of Gregg, Upshur, Smith, Eastern Cherokee, and Rusk,

Texas, which shall constitute and be known as the East Texas Field.

No variation from or exception to the provisions of this order shall be permitted or valid unless given in writing by the Railroad Commission of Texas or its Agent in charge of the enforcement of its orders in said field.

Rule 22, under Division 3, Special Rules governing the East Texas Field of the General Rules and Regulations of October 17, 1933;

Open flow tests have been and will be hereafter made according to the following plan:

A. All wells heretofore designated and used as key wells for the basing of potentials on all wells in the East Texas Field shall be re-tested, and or any additional wells requested by any operator of said well. The initial test on these key wells shall be equipped and tested on or before October 15, 1935.

886 B. All mechanical operations for test of each well except gauging for the purpose of determining the amount of oil produced from each well so tested, shall be carried out by the owner, operator or the duly authorized agent of either, but shall be under the supervision of the Engineering Department of the Railroad Commission of Texas and such tests shall be made according to the following schedule or plan:

The officer or Agent of the Commission in charge of said field shall assign sufficient inspectors to each district to supervise all tests as required. The test of any well may be witnessed by the owner, operator or manager of any well in the section in which is located such

well as is being tested, and/or the owner, operator or manager of any well in a section contiguous to the section on which is located such well as is being tested or the duly authorized agent or representative of either, and for such purpose such owner, operator or manager or the duly authorized agent or representative thereof shall have the right of ingress and egress to the well being tested.

C. All wells selected as test wells shall be as nearly as practicably possible be made to conform to the following specifications as to equipment, to-wit:

Flow lines shall be sufficient to carry the open flow of the well through casing and tubing and in no event shall be more than four inches in diameter and shall not be more or less than three in number. Wells shall be flowed direct into tanks and every precaution must be taken during the test to eliminate the hazard of fire and or explosion.

D. Each test shall be tested two hours by flowing naturally through casing and tubing and no test will be considered that does not flow the full required  
887 time specified in this order. The potential allocated will be the average hourly flow for the two hour period.

E. The owner, manager or operator of each test well and the Agent, deputy or employee of the Commission supervising the test on the particular well shall make a joint report of such test and certify to the correctness thereof, said report to be made as hereafter provided on the proper form which form shall contain the following information, to-wit:

1. A legal description of the lease on which such test well is located.

2. The number of the well, the test of which is being reported.

3. The record of bottom and top gauges required in Paragraph 7 hereof.

4. A mathematical calculation as to the number of barrels of marketable oil which is run into the tank or tanks during the two hour period herein described. The term "marketable oil" means any crude petroleum adopted for refining or fuel properly settled and containing not more than 2% basis sediment, water or other impurities above a point six (6) inches below the pipe line connection with the tank.

5. The name, and if known to the person making the report, the post office address or addresses of the owner and or owners of the lease on which such test well is located.

6. If known to the person making the report, the name and post office address or addresses of the owner or owners of the fee title to the land on which such well is located.

7. The Central Standard Time at which such well was opened for test.

8. The Central Standard Time at which such well was shut in.

9. No test shall begin earlier than seven (7) a. m. and all tests must be completed by seven (7) p. m. Central Standard Time.

888 10. The size of tubing and of flow string of casing with which such well was equipped at the time of and during such test.

11. The size and length of flow lines.
12. The closed in tubing and casing pressure before and after the test prescribed herein and the flowing pressure.

F. A settled bottom gauge shall be taken on tank or tanks in which well is being tested before test is started. Each tank shall be allowed to stand fifteen (15) minutes after the sixty (60) minute flow before taking top gauge. Gauge shall be reported to the nearest quarter inch. Not more than one well shall be tested in the same tank at the same time and no test well shall be flowed into any one tank for more than sixty (60) minute period hereinabove mentioned.

G. The oil produced from each well during the test prescribed herein shall be charged against the future allowable production of the owner, manager or operator whose well is being tested. Production in excess of the daily allowable obtained by taking potentials will be made up ratably during the test. Where the Commission requests an operator to test wells in order to prove the producing conditions of a local area, which will include all wells that are being retested during the period between September 25th and October 15th, 1935, shall be given one-half (1/2) of the total amount of oil produced on the two (2) hour test to compensate for the expense of making such test. This oil shall be tendered and not charged against the future allowable for the well tested. This does not mean that the Commission will defray either part or all of the expense of future wells which will be tested where the operators request such tests; in other words, after October 15th, 1935, no well will be given oil to help defray the expense of taking potential tests.

H. Any operator who can show just cause for the taking of a potential test of his well shall make application for same within the first three days after the first of each calendar month and if application for such is granted, by the Commission, such test well shall be made before the 15th of such month and no correction on the schedule shall be made until the next effective schedule date.

RAILROAD COMMISSION OF  
TEXAS,

ERNEST O. THOMPSON,

Chairman,

C. V. TERRELL,

Commissioner,

LON A. SMITH,

Commissioner.

(Seal)

Attest:

C. F. PETET,

Secretary.

EXHIBIT 46.

Railroad Commission of Texas.

Oil and Gas Division.

Oil and Gas Dockets Nos. 108, 120, 123, 124, 125, 126,  
128, 129, 132 and 146.

In Re: Conservation and Prevention of Waste of Crude  
Petroleum and Natural Gas in the State of Texas.

Austin, Texas, December 6, 1935.

Special Rules Governing the East Texas Field.

The following rules shall govern the present producing areas and extensions thereof in the Counties of Gregg,

890 Upshur, Smith, Eastern Cherokee, and Rusk in the State of Texas, which shall constitute and be known as the East Texas Field.

No variation from or exception to the provisions of this Order shall be permitted or valid unless given in writing by the Railroad Commission of Texas or its agent in charge of the enforcement of its orders in said field.

Rule 22, under Division 3, Special Rules governing the East Texas Field of the General Rules and regulations of October 17, 1933;

Open flow tests have been and will be hereafter made according to the following plan:

A. All wells heretofore designated and used as key wells for the basing of potentials on all wells in the East Texas Field shall be retested, and or any additional wells requested by any operator of said well. The initial test on these key wells shall be equipped and tested on or before January 12, 1935.

B. All mechanical operations for test of each well except gauging for the purpose of determining the amount of oil produced from each well so tested, shall be carried out by the owner, operator or the duly authorized agent of either, but shall be under the supervision of the Engineering Department of the Railroad Commission of Texas, and such tests shall be made according to the following schedule or plan:

The officer or agent of the Commission in charge of said field shall assign sufficient inspectors to each district to supervise all tests as required. The test of any well may be witnessed by the owner, operator or man-

ager of any well in the Section in which is located such well as is being tested, and or the owner, operator or manager of any well in a Section contiguous to the section on which is located such well as is being tested or the duly authorized agent or representative of either, and for such purpose such owner, operator or manager or the duly authorized agent or representative thereof shall have the right of ingress and egress to the well being tested.

C. All wells selected as test wells shall be as nearly as practicably possible made to conform to the following specifications as to equipment, to-wit:

Flow lines shall be sufficient to carry the open flow of the well through casing and tubing and in no event shall be more than four inches in diameter and shall not be more or less than three in number. Wells shall be flowed direct into tanks, and every precaution must be taken during the test to eliminate the hazard of fire and or explosion.

D. Each test shall be tested two hours by flowing naturally through not more or less than 7" O. D. casing and not more than 2 1/2" tubing and no test will be considered that does not flow the full required time specified in this order. The potential allocated will be the average hourly flow for the two hour period.

E. The owner, manager or operator of each test well and the agent, deputy or employee of the Commission supervising the test on the particular well, shall make a joint report of such test and certify to the correctness thereof, said report to be made as hereafter provided on the proper form which form shall contain the following information, to-wit:

1. A legal description of the lease on which test well is located.

892 2. The number of the well, the test of which is being reported.

3. The record of bottom and top gauges required in Paragraph 7 hereof.

4. A mathematical calculation as to the number of barrels of marketable oil which is run into the tank or tanks during the two hour period herein described. The term "marketable oil" means any crude petroleum adapted for refining or fuel properly settled and containing not more than 2% basic sediment, water or other impurities above a point six (6) inches below the pipe line connection with the tank.

5. The name, and if known to the person making the report, the post office address or addresses of the owner and or owners of the lease on which such test well is located.

6. If known to the person making the report, the name and post office address or addresses of the owner or owners of the fee title to the land on which such well is located.

7. The Central Standard Time at which such well was opened for test.

8. The Central Standard Time at which such well was shut in.

9. No test shall begin earlier than seven (7) a. m., and all tests must be completed by seven (7) p. m., Central Standard Time.

893 10. The size of tubing and of flow string of casing with which such well was equipped at the time of and during such test.

11. The size and length of flow lines.

12. The closed-in tubing and casing pressure before and after the test prescribed herein and the flowing pressure.

F. A settled bottom gauge shall be taken on tank or tanks in which well is being tested before test is started. Each tank shall be allowed to stand fifteen (15) minutes after the sixty (60) minute flow before taking top gauge. Gauge shall be reported to the nearest quarter inch. Not more than one well shall be tested in the same tank at the same time and no test well shall be flowed into any one tank for more than sixty (60) minute periods hereinabove mentioned.

G. The oil produced from each well during the test prescribed herein shall be charged against the future allowable production of the owner, manager, or operator whose well is being tested. Production in excess of the daily allowable, obtained by taking potentials, shall be made up ratably during the test. Where the Commission requests an operator to test wells in order to prove the producing conditions of a local area, and in order to properly complete its potential map, which will include all wells that are being retested during the period between December 6, 1935, and January 12, 1936, shall be given one-half (1/2) of the total amount of oil produced on the two (2) hour test to compensate for the expense of making such test.

894 In instances where the value of one-half (1/2) of the total volume of oil produced does not compensate the operator for the cost of taking said potential test the Commission will allow sufficient oil to

be produced above the prevailing daily allowable to equal the expense incurred in making said test. In no event shall the expenses incurred include purchase of material, but shall cover only the cost of services rendered and rental of equipment. The operator in applying for oil to cover cost of making test shall submit to the Commission's Engineering Department at Kilgore an itemized and sworn statement of cost which must be acceptable to said Commission's representative before authority for oil in excess of the daily allowable will be granted.

This oil shall be tendered and not charged against the future allowable for the well tested. This does not mean that the Commission will defray either part or all of the expense of future wells which will be tested where the operators request such tests; in other words, after January 12, 1936, no well will be given oil to help defray the expense of taking potential tests.

H. Any operator who can show just cause for the taking of a potential test on his well after February 1, 1936, shall make application for same within the first three (3) days after the first of each calendar month and if application for such is granted, by the Commission, such test shall be made before the 12th of such month and no correction on the schedule shall be made until the next effective schedule date.

RAILROAD COMMISSION OF  
TEXAS.

ERNEST O. THOMPSON,  
Chairman.

C. V. TERRELL,  
Commissioner,

L. A. SMITH,  
Commissioner.

(Seal)

Attest:

C. F. PETET,  
Secretary.

895

## EXHIBIT No. 47.

## Railroad Commission of Texas.

## Oil and Gas Division.

Oil and Gas Dockets Nos. 108, 120, 123, 124, 125, 126, 128,  
129, 132 & 146.

In Re: Conservation and Prevention of Waste of Crude  
Petroleum and Natural Gas in the State of Texas.

Austin, Texas, August 26, 1935.

Special Order Fixing Allowable Production of Crude Oil  
in the Various Fields and Districts in Texas.

Whereas, after due notice hearings have been held at Austin, Texas, at various times, including hearing on August 19, 1935, with respect to the existence and imminence of waste of oil and gas in the State of Texas, and the prevention thereof; and

Whereas, in view of the evidence, including among other matters the physical conditions in the various fields, the transportation and marketing facilities, the reasonable market demand, the reasonableness of the allocation as between fields of the allowable production under previous orders; and

Whereas, the Railroad Commission of Texas finds from the evidence that the reasonable market demand for oil produced in this State from the various fields and districts therein equals the amount hereinafter shown as the allowable production thereof during the period beginning at 7 o'clock a. m. September 1, 1935, and ending at 7 o'clock a. m., October 1, 1935; and

Whereas, the Railroad Commission of Texas finds that waste exists or is imminent and that to prevent such waste of oil and gas, as the same is defined by the applicable Statutes, it is necessary to restrict the  
 896 production of oil in the State of Texas as provided for herein;

Whereas, at the hearing of the Railroad Commission of Texas on August 19th, 20th, 26th and 27th, 1935, the Railroad Commission of Texas heard at great length the proposal as outlined by the witness F. E. Heath, who testified on behalf of the Humble Oil & Refining Company, The Texas Company, the Shell Company, the Sun Oil Company, the Tidewater Company, Magnolia Petroleum Company and the Amerada Company, whose formula would put the East Texas field on a plan of acreage proration, which plan was acreage times potential with a ten acre spacing rule, which works out as follows:

Under certain conditions, the owner of a ten acre tract in the East Texas field with one well on this tract would be allowed 29 barrels of allowable production of petroleum each day, and the owner of a tract of one acre with one well on it, under the same conditions, would be allowed to produce 2.9 barrels of oil per day. This plan was later extended by the proponents to the extent that it was recommended that the Commission make exceptions so that the man with a well on one acre would be allowed substantially eight barrels of oil per day or enough oil to bring \$8.00 per day, or some such amount, in the discretion of the Commission, which would allow the small operator to make a profit out of his operation.

The Commission, after an exhaustive hearing on this matter, finds that the present method of proration in effect in the East Texas field at this time, which is to allow the well to produce that amount below set out, which is

three per cent of the average hourly potential  
 897 producing capacity of each well, as determined  
 by the Commission, is the fairest method possible.

The Commission further finds that this method of pro-  
 ration prevents waste, conserves the oil and gas within  
 the East Texas field, and does not result in injury to any  
 lease operator or owner in said field.

In the recent case of *Brown v. Humble Oil & Refining  
 Company*, the Supreme Court announced certain rules for  
 our guidance in enforcing the provisions of Rule 37. We  
 recognize the authority of that Court to construe the laws  
 under which we function, as well as its authority to review  
 orders pursuant to statute or under the circumstances out-  
 lined in that opinion; and it is not only our duty but our  
 desire and intention to comply with its decrees. However,  
 in this instance, the importance of its decision to this  
 body, the public and the industry is so great that we must  
 undertake to be certain, both of our understanding of the  
 scope of the judgment and of its finality.

As an administrative body, our temporary difficulty  
 arises out of certain expressions in the opinion, founded  
 on fact issues, which are not consonant with the evidence  
 presented to this Commission over a period of years on the  
 same essential facts as presented at this and prior hearings  
 held by this Commission. If such expressions are limited  
 to facts necessary to a decision of that case, they present  
 no confusion, but, if they are intended to form a rule of  
 property for our guidance in all cases, then it appears to  
 us that the importance of the question merits clarification.

In the opinion referred to, the Court observes, "It is  
 now, however, recognized that when an oil field  
 898 has been fairly tested and developed, experts can  
 determine approximately the amount of oil and

gas in place in a common pool, and can, also, equitably determine the amount of oil and gas recoverable by the owner of each tract of land under certain operating conditions."

Based upon this finding, the Court then defines our duties in the following language, in part:

"Also conditions may arise where it would be proper, right and just to permit tracts to be subdivided, and such subdivisions drilled after the adoption of the rule; but in all such instances it is the duty of the Commission to adjust the allowable, based upon the potential production, so as to give the owner of such smaller tract only his just proportion of the oil and gas. By this method each person will be entitled to recover a quantity of ~~oil~~ and gas substantially equivalent in amount to the recoverable oil and gas under his land."

Our uncertainty arises out of the fact that, in the exercise of our duties at hearings held over a number of years, a substantially preponderant majority of the expert witnesses have testified under oath to facts which do not harmonize with but contradict the statement that "when an oil field has been fairly tested and developed, experts can determine approximately the amount of oil and gas in place in a common pool and can, also, equitably determine the amount of oil and gas recoverable by the owner of each tract of land under certain operating conditions." In fact, the testimony we have heard at this and other hearings held in the past is to the effect that surface

ownership has no true relation to the oil and gas reserves which may underlie the particular surface, and that sufficient information is not available in the state of engineering science today to determine with that degree of exactitude indicated by the quotation from the opinion the amount of oil and gas in place in

a common pool, and . . . to equitably determine the amount of oil and gas recoverable by the owner of each tract under certain operating conditions.

We further find from the evidence the more wells that are drilled the greater will be the ultimate recovery of oil and gas from any given pool.

The hearing just closed raises grave doubts as to the wisdom or value of any Rule 37 in preventing waste or in aid of the recovery of oil, except in the instances of certain new fields and then only as a prevention of fire hazards and blowout dangers.

Now, Therefore, in order to prevent the waste of oil and gas in the State of Texas, which will take place by authorizing production over the said period in excess of the reasonable market demand;

It is Hereby Ordered that beginning at 7 o'clock a. m., Sunday, September 1, 1935, and continuing to October 1, 1935, unless other periods are prescribed herein, the production of oil in the State of Texas, and the various fields therein, until further ordered, shall not exceed the amounts hereinafter shown as the allowable production thereof, and in order to adjust the current allowable production of crude oil in Texas, as nearly as may be, to the demand as shown, the allowable daily production of the various fields and districts in said State shall be limited to the amounts hereinafter specified and the following orders fixing such limitation on production in the various fields and districts are hereby adopted.

1. Rule 2 of Division 2 as contained in an order of this Commission dated October 17, 1933, pertaining to the Panhandle District of Texas is hereby readopted and amended as follows:

Rule 2. Not more than fifty-two thousand eight hundred (52,800) barrels of crude oil shall be produced from said district during any day of the effective period of this order. Moore County shall not produce in excess of fifteen hundred (1500) barrels per day. Moore County allowable is additional to Panhandle allowable.

2. Rule 23 (a) of Division 3, as contained in an order of this Commission dated October 17, 1933, pertaining to the East Texas Field is hereby readopted and amended as follows:

Rule 23 (a). It is ordered that during each twenty-four (24) hour period beginning at 7 a. m., Central Standard Time, September 1, 1935, the owner or operator or manager of each well in the East Texas Field, shall be permitted, either collectively or individually, to produce daily from each well a maximum of Three (3%) per cent of its average hourly potential producing capacity as determined by the Commission.

3. Rule 2 of Division 5, as contained in an order of this Commission dated October 17, 1933, pertaining to the North Texas District is hereby readopted and amended as follows:

Rule 2. Not more than fifty-eight thousand five hundred (58,500) bbls. crude oil shall be produced from said district during any day of the effective period of this order. Foard County shall not produce in excess of eight hundred thirty-seven (837) barrels per day. Foard County allowable is additional to North Texas allowable.

4. Rule 2 of Division 6, as contained in an order of this Commission dated October 17, 1933, pertaining to the West Central Texas District is hereby readopted and amended as follows:

Rule 2. Not more than forty nine thousand one hundred ninety five (49,195) barrels of crude oil shall be produced from said District during any day of the effective period of this order, which is distributed to the various counties as follows:

Brown	2006	McCullough	1
Callahan	1631	Palo Pinto	447
Coleman	1310	Reagan (Big Lake)	9800
Comanche	84	Reagan (Grayson)	180
Crockett (Todd)	10	Shackelford	5873
Crockett (World)	835	Stephens	5080
Eastland	3191	Throckmorton	483
Erath	113	Taylor	130
Fisher	5331	Upton (McCamey)	5920
Haskell	17	Young (S 2)	4079
Irion	56	Runnels	520
Jones	2098		

5. Rule 4 of Division 7, as contained in an order of this Commission dated October 17, 1933, pertaining to the West Texas District is hereby readopted and amended as follows:

Rule 4. Not more than one hundred thirty thousand one hundred twenty (130,120) barrels of crude oil per day shall be produced from said District during any day of the effective period of this order, which shall be distributed to the various fields therein as follows:

Brown & Altman	212	Netterville	9
Church & Fields	5830	Monroe	25
Cowden, North	3270	Means	605
Cowden, South	580	Parker	119
Crane-Cowden	372	Pecos Valley	225
Crane-Waddell	313	Richards	12
Deep Rock	239	Halley	100

Edwards	4	Northwest	23
Ector-Harper	125	Scarbrough	23
Ector-Penn	5088	Sealey	66
Fuhrmans	900	Shipley	1580
Gulf-McElroy	3865	Taylor-Link	1165
Sayre	1650	Tobarg	1750
Hendricks	16150	Ward, North	5650
Howard-Glasscock	20000	Ward, South	9800
Iatan-East Howard	4000	Westbrook	919
Johnson	35	Walker	12
Keystone	350	White & Baker	2
Leck	500	Yates	39124
Loving (Wheat)	1986	Goldsmith	375
Masterson	250	Sand Hills	15
McClintic	500		

6. Rule 2 of Division 4, as contained in an Order of this Commission dated October 17, 1933, pertaining to the East Central Texas District is hereby readopted and amended as follows:

Rule 2. Not more than forty seven thousand eight hundred thirty six (47,836) barrels of crude oil per day shall be produced from said fields in said District during any day of the period of September 1, 1935, to October 1, 1935; said amounts shall be allocated to the various fields in the following amounts:

Boggy Creek	572	Rusk	450
Camp Hill	651	Richland	35
Cayuga	3720	Powell	2244
Curry	148	South Bosque	12
Corsicana	415	Van	35733
Long Lake	200	Van Shallow	215
Mexia	2145	Trinity	1174
Post Oak	2	Wortham	102
Pottsboro	6	Wortham Shallow	12

7. Rule 2 of Division 8, as contained in an order of this Commission dated October 17, 1933, pertaining to the Southwest Texas District is hereby readopted and amended as follows:

Rule 2. Not more than ninety five thousand nine hundred nine (95,909) barrels of crude oil shall be produced in said District during any day of the effective period of this order, and the same shall be distributed to all fields in said district as follows:

#### Division 1.

Alta Vista .....	5	Kimbro .....	22
Bateman .....	247	Larremore .....	40
Bob Rose .....	73	Lomo Alto .....	132
Buchanan .....	41	Lowe .....	1
Callahan .....	48	Luling-Branyon .....	5637
Carroll .....	84	Lytton-Springs .....	396
Cedar Creek .....	42	Manford .....	36
Cedar Creek (N) .....	200	Matthews .....	59
Chapman-Abbott .....	398	Meaders .....	6
Ghicon Lake .....	13	Minerva Rockdale .....	203
Clark .....	100	Noack .....	731
Cooksey .....	16	Pearsall .....	(shut in)
Darst Creek .....	8932	Schimmel-Batts .....	1
Dale .....	165	Somerset .....	733
Dunlap .....	15	Southton .....	72
Eckert .....	271	Taylor Ina .....	12
Espada Mission .....	1	Thrall .....	53
Gas Ridge .....	7	Salt Flat .....	4112
Hilbig .....	722	Von Ormy .....	39
Jones .....	1	Yoast .....	76
Jacobs .....	595		

## Division 2.

Caesar .....	950	Pettus. (New) .....	870
Coletta Creek .....	660	Port Lavaca .....	600
Dinero .....	240	Quintanna-O'Connor ..	1600
Dirks .....	1900	Ray .....	950
Greta .....	11830	Refugio (Dcep Sand) ..	195
Keeran .....	320	Refugio (New) .....	1305
McFadden .....	130	Refugio (Old) .....	2800
McNeil .....	500	Hords Creek .....	2
Mineral .....	10	Tuleta .....	2527
Mt. Lucas .....	210	Vanderbilt .....	100
Normanna .....	15	Worthington .....	200
O'Connor-McFadden ..	350	Mekeska .....	150
Placedo .....	470	Mauritz .....	150
Pettus .....	1661		

## Division 4.

Albercas .....	111	Laurel .....	95
Alworth .....	3	Loma Novia .....	2520
Angelita .....	3	Lopez .....	450
Aviators .....	409	Los Olmos .....	200
Barbacosa .....	38	Mercedes .....	150
Bruni .....	2975	Mirando City .....	389
Carolina-Tex .....	23	Mirando Valley .....	25
Charco Redondo .....	9	Moca .....	614
Cole East .....	37	O'Hern .....	920
Cole West .....	753	Piedras Pintas .....	45
Cuellar .....	113	Plymouth .....	1800
Driscoll .....	249	Premont Prospect .....	20
Eagle Hill .....	471	Randado .....	334
Escobas .....	1396	Rio Grande City .....	384
Government Wells		Roma .....	4
(N) .....	11233	Sinton .....	594
Government Wells		Seven Sisters .....	320
(S) .....	5789	S. R. C. ....	40

Guerra .....	372	White Point .....	38
Henne-Winch-Farris .....	26	Sam Fordyce .....	3126
Jennings .....	555	Sarnosa .....	940
Kingsville .....	61	Saxet (Old) .....	1262
Kohler .....	132	Saxet (New) .....	1849

8. Rule 2 of Section A, Division 8, as contained in an order of this Commission dated October 17, 1933, pertaining to the Gulf Coast District is hereby readopted and amended as follows:

Rule 2. Not more than one hundred forty seven thousand three hundred forty eight (147,348) barrels of crude oil per day shall be produced from said fields of said district during any day of the effective period of this order which shall be distributed to said fields as follows:

Allen Dome .....	5	Louise .....	1241
Anahuac .....	900	Livingston .....	2666
Ariola .....	1150	Manvel (Miocene) .....	4008
Bay City .....	35	Manvel (Oligocene) .....	3500
Big Creek .....	931	Markham .....	1349
Blue Ridge .....	1013	Mykawa .....	775
Boling .....	605	Mykawa (New) .....	2100
Brenham .....	6	Nash Dome .....	35
Brookshire .....	16	North Dayton .....	162
Buckeye .....	220	Old Ocean .....	200
Batson .....	690	Orchard .....	600
Batson (New) .....	621	Orange .....	741
Barbers Hill .....	17205	Pickett Ridge .....	150
Clay Creek .....	1079	Port Neches .....	1488
Cleveland .....	775	Pierce Junction .....	2790
Coproe .....	39,525	Pierce Junction (Vicks-	
Damon Mound .....	521	burg) .....	583
Dickinson .....	964	Raccoon Bend .....	2883
Esperson Dome .....	1200	Raccoon Bend (Cock-	
Fannett .....	694	field) .....	1581

Goose Creek .....	2857	Rockland .....	3
Gillock .....	(shut-in)	Saratoga .....	850
High Island .....	6170	Schwab .....	56
Hankamer .....	1858	Sugarland .....	5580
Hankamer (New) ...	350	Sour Lake .....	1755
Hardin .....	150	South Liberty .....	586
Hastings .....	1800	Spindletop .....	2597
Hull (Old) .....	3583	Thompson .....	10,737
Hull (New) .....	2961	Tomball .....	4,650
Humble .....	3255	West Columbia .....	2321
Lost Lake .....	230		

It is Further Ordered that allowable oil in the foregoing order is oil measured on 100 per cent tank tables according to the Pipe Line Rule Number Nine (9) and corrected to sixty (60) degrees Fahrenheit.

It is Further Ordered that this Cause be held open on the docket for such further orders as may be necessary and supported by evidence of record in above Cause.

RAILROAD COMMISSION OF  
TEXAS,

ERNEST O. THOMPSON,  
Chairman.

C. V. TERRELL,  
Commissioner.

LON A. SMITH,  
Commissioner.

(Seal)

Attest:

C. F. PETET, Secretary.

## EXHIBIT No. 48.

Railroad Commission of Texas.

Oil and Gas Division.

Oil and Gas Docket Nos. 108, 120, 123, 124, 125, 126, 128,  
129, 132 & 146.

In Re: Conservation and Prevention of Waste of Crude  
Petroleum and Natural Gas in the State of Texas.

Austin, Texas, February 24, 1936.

Special Order Fixing the Allowable Production of Crude  
Oil in the Various Fields and Districts in Texas.

Whereas, after due notice hearings have been held at Austin, Texas, at various times, including hearing on February 18, 1936, with respect to the existence and imminence of waste of oil and gas in the State of Texas, and the prevention thereof; and

Whereas, in view of the evidence, including among other matters the physical conditions in the various fields, the transportation and marketing facilities, the reasonable market demand, the reasonableness of the allocation as between fields of the allowable production under previous orders; and

Whereas, the Railroad Commission of Texas finds from the evidence that the reasonable market demand for oil produced in this State from the various fields and districts therein equals the amount hereinafter shown as the allowable production thereof during the period beginning at 7 o'clock a. m., March 1, 1936, and ending at 7 o'clock a. m., April 1, 1936; and

Whereas, the Railroad Commission of Texas finds that waste exists or is imminent and that to prevent such waste of oil and gas, as the same is defined by the applicable Statutes, it is necessary to restrict the  
 908 production of oil in the State of Texas as provided for herein, and

Whereas, The Railroad Commission's Special Order Fixing Allowable Production of Crude Oil in the Various Fields and Districts in Texas, dated August 26, 1935, contains the following language:

"We further find from the evidence the more wells that are drilled the greater will be the ultimate recovery of oil and gas from any given pool."

By ~~this~~ language the Commission did not mean and did not find from the evidence that the closer wells are drilled the greater will be the ultimate recovery of oil and gas from any given pool, but by such language only meant and found from the evidence that the more wells that are drilled *in conformity with the spacing rules* as applicable to the various fields in Texas the greater will be the ultimate recovery of oil and/or gas from any given pool.

It was not then the intention and is not now the intention of the Railroad Commission to abrogate or abandon any of the spacing rules now in effect and applicable to the various oil and gas fields in Texas, nor to militate against the fact basis on which the Commission's spacing rules are based.

Now, Therefore, in order to prevent the waste of oil and gas in the State of Texas, which will take place by authorizing production over the said period in excess of the reasonable market demand;

It is Hereby Ordered that beginning at 7 o'clock a. m., Sunday, March 1, 1936, and continuing to April 1, 1936; unless other periods are prescribed herein, the production of oil in the State of Texas, and the various fields therein, until further ordered, shall not exceed the amounts hereinafter shown as the allowable production thereof, and in order to adjust the current allowable production of crude oil in Texas, as nearly as may be, to the demand as shown, the allowable daily production of the various fields and districts in said State shall be limited to the amounts hereinafter specified and the following orders fixing such limitation on production in the various fields and districts are hereby adopted.

1. Rule 2 of Division 2 as contained in an order of this Commission dated October 17, 1933, pertaining to the Panhandle District of Texas is hereby readopted and amended as follows:

Rule 2. Not more than Fifty Eight Thousand and Eight Hundred (58,800) barrels of crude oil shall be produced from said district during any day of the effective period of this Order. Moore County shall not produce in excess of Fifteen Hundred (1500) barrels per day. Moore County allowable is additional to Panhandle allowable. The Osborne Area in Wheeler County shall not produce in excess of One Thousand (1,000) barrels per day. The Osborne Area allowable in addition to the Panhandle allowable.

2. Rule 23 (a) of Division 3, as contained in an order of this Commission dated October 16, 1933, pertaining to the East Texas Field is hereby readopted and amended as follows:

Rule 23 (a). Whereas, The Railroad Commission of Texas finds from evidence submitted to it at a hearing held in Austin, Texas, on February 18, 1936, and at pre-

vious hearings held before this regulatory body, that the reservoir of the East Texas Field has its energy supplied by a hydrostatic drive which encroaches from the west to the east, and only a certain amount of crude oil can be withdrawn daily from the East Texas reservoir in order to utilize to the greatest extent the energy necessary for the production and recovery of the greatest amount of oil ultimately from the reservoir. It has been recommended to the Commission by competent engineers that not more than 425,000 to 450,000 barrels of crude oil should be allowed to be produced from the East Texas reservoir in any one day in order that the reservoir might be depleted with the least amount of waste incurring. Evidence was also submitted to the Commission at these hearings that the production of from 425,000 to 450,000 barrels of crude oil will prohibit the coning of water; the uneven encroachment of water, and the subsequent trapping of much oil that otherwise, under higher daily allowables of crude oil, would not be recovered.

Therefore, it is Further Ordered by the Railroad Commission of Texas, that during each twenty-four (24) hour period beginning at 7 o'clock a. m., Central Standard Time, March 1, 1936, the owner or operator or manager of each well in the East Texas Field shall be permitted, either collectively or individually, to produce daily from each well a maximum of Two Point Eighty Five (2.85%) Per Cent of its average hourly potential producing capacity as determined by the Commission.

3. Rule 2 of Division 5, as contained in an order of this Commission dated October 17, 1933, pertaining to the North Texas District is hereby readopted and amended as follows:

Rule 2. Not more than Fifty Eight Thousand Five Hundred (58,500) barrels of crude oil shall be produced from

said district during any day of the effective period of this order. Foard County shall not produce in excess of Five Hundred (500) Barrels Daily. Foard County allowable is additional to North Texas allowable.

4. Rule 2 of Division 5, as contained in an order of this Commission dated October 17, 1933, pertaining to the West Central Texas District is hereby readopted and amended as follows:

Rule 2. Not more than Fifty Thousand Six Hundred Fifteen (50,615) barrels of crude oil shall be produced from said District during any day of the effective period of this Order, which is distributed to the various counties as follows:

Brown .....	1761	McCullough .....	6
Callahan .....	1556	Palo Pinto .....	382
Coleman .....	1165	Reagan (Big Lake) ..	8020
Cemanche .....	74	Reagan (Grayson) ...	172
Crockett (Todd) ....	10	Shackelford .....	6443
Crockett (World) ....	1060	Stephens .....	4691
Eastland .....	3060	Throckmorton .....	453
Erath .....	112	Taylor .....	129
Fisher .....	5423	Upton (McCamey) ...	7782
Haskell .....	18	Young South 2 .....	4503
Irion .....	47	Runnels .....	370
Jones .....	3338	Webb-Ray .....	40

5. Rule 4 of Division 7, as contained in an order of this Commission dated October 17, 1933, pertaining to the West Texas District is hereby readopted and amended as follows:

Rule 4. Not more than One Hundred Forty Seven Thousand Nine Hundred Sixty Five (147,965) barrels of crude oil, per day shall be produced from said District during

any day of the effective period of this Order, which shall be distributed to the various fields therein as follows:

Goldsmith	400	Netterville	15
Bashara	102	Monroe	25
Brown-Altman	371	Means	1185
Church-Fields	6960	Parker	50
Cowden, North	4350	Pecos Valley	372
Cowden, South	400	Penwell	6718
Crane-Cowden	572	Richards	10
Deep Rock	300	Snyder	-0-
Edwards	-0-	Northwest	28
Foster	100	Scarborough	1875
Fuhrmans	750	Sealey	535
Gulf-McClroy	4640	Shipley	1580
Sayre	3650	Taylor-Link	1350
Hendricks	14600	Tobarg	1825
Harper	96	Ward, North	12000
Halley	149	Ward, South	12245
Sand Hills	54	Westbrook	867
Howard-Glasscock	20000	Waddell	1528
Iaatan-E. Howard	4440	Walker	10
Johnson	30	Wheat	1850
Keystone	1168	White & Baker	3
Leck	500	Yates	38435
Masterson	211	Sand Hill (Ordovician)	150
McClintic	932	Emperor	415
McKinzie	10	Dobbs	100

6. Rule 2 of Division 4, as contained in an Order of this Commission dated October 17, 1933, pertaining to the East Central Texas District is hereby readopted and amended as follows:

Rule 2. Not more than Fifty Thousand Two Hundred Twenty-Five (50,225) barrels of crude oil per day shall be produced from said fields in said District during any day

of the period of March 1, 1936, to April 1, 1936; said amounts shall be allocated to the various fields in the following amounts:

Bethany .....	16	Rusk .....	300
Boggy Creek .....	573	Richland .....	28
Camp Hill .....	675	Powell .....	2332
Cayuga .....	5104	Rodessa .....	500
Curry .....	131	South Bosque .....	11
Corsicana .....	434	Van .....	35733
Long Lake .....	750	Van Shallow .....	164
Mexia .....	2197	Trinity .....	1085
Post Oak .....	1	Wortham .....	95
Potter .....	70	Wortham (Shallow) ..	12
Pottsboro .....	4	East Freestone .....	10

7. Rule 2 of Division 8, as contained in an order of this Commission dated October 17, 1933, pertaining to the Southwest Texas District is hereby readopted and amended as follows:

Rule 2. Not more than One Hundred Thirty Two Thousand One Hundred Fifty Nine (132,159) barrels of crude oil shall be produced in said District during any day of the effective date of this Order, and same shall be distributed as follows:

#### Division I.

Alta Vista .....	5	Lowe .....	-0-
Bateman .....	206	Luling-Branyon .....	5550
Bob Rose .....	35	Lytton-Springs .....	377
Buchanan .....	41	Manford .....	30
Callahan .....	146	Matthews .....	51
Carroll .....	28	Meaders .....	-0-
Cedar Creek .....	52	Minerva Rockdale ..	220
Cedar Creek (N) ..	26	Noack .....	314

Chapman-Abbott	344	Pearsall	550
Chicon Lake	17	Schimmel-Batts	1
Clark	235	Somerset	700
Cooksey	13	Southton	67
Darst Creek	8968	Taylor <del>Isa</del>	7
Dale	160	Thrall	46
Dunlap	10	Salt Flat	4173
Eckert	276	Von Ormy	80
Espada Mission	1	Yoast	55
Gas Ridge	8	Larremore	48
Hilbig	791	Zoborski	10
Jones	-0-	Staples	3
Jacobs	595		
Kimbro			24,366
Kimbro (New)	47		
Loma Alto	80		

## Division II.

Caesar	1263	Port Lavaca	850
Coletta Creek	693	Quintanna-O'Connor	3000
Dinero	135	Ray	1781
Dirks	5040	Refugio (Deep Sand)	99
Greta	14930	Refugio (New)	2250
Greta Deep	1180	Refugio (Old)	2520
Keeran	300	Hords Creek	68
McFadden	32	Tuleta	1548
McNeil	175	Vanderbilt	10
Mineral	-0-	Worthington	76
Mt. Lucas	60	Fort Merrill	170
Normanna	12	Mauritz	150
O'Connor-McFadden	275	Whittington	1
Placedo	1902	Diamond Half	-0-
Pettus	1521		
Pettus (New)	1000		41,041

## Division IV.

Albercos .....	100	Lopez .....	1750
Alworth .....	-0-	Los Olmos .....	137
Angelita .....	-0-	Mercedes .....	165
Aviators .....	408	Mirando City .....	369
Baldwin .....	874	Mirando Valley .....	35
Barbacosa .....	15	Moca .....	666
Bruni .....	2200	O'Hern .....	2625
Carolina-Tex .....	5	Piedras Pintas .....	9
Charco Redondo .....	10	Plymouth .....	6790
Clara Driscoll .....	150	Premont Prospect .....	-0-
Cole East .....	32	Randado .....	322
Cole West .....	608	Rio Grande City .....	240
Cuellar .....	120	Roma .....	3
Comitas .....	6	Corpus Christi .....	1718
Driscoll .....	320	Sinton .....	50
Eagle Hill .....	425	Seven Sisters .....	2520
Escobas .....	1160	S. R. C. ....	53
Gov't Wells (N) .....	11792	White Point .....	20
Gov't Wells (South) .....	6024	Sam Fordyce .....	4686
Guerra .....	412	Sarnosa .....	957
Hagist .....	110	Saxet (Old) .....	2528
Henne-Winch-Faris ..	10	Saxet (New) .....	4967
Hoffman .....	40	Taft .....	150
Jennings .....	635	Cole Middle .....	56
Kingsville .....	56	South Clarkwood .....	20
Kohler .....	115	Loma Vista .....	75
Laurel .....	39	Piedra Lumbre .....	200
Loma Novia .....	9975		
			66,752

8. Rule 2 of Section A, Division 8, as contained in an order of this Commission dated October 17, 1933, pertaining to the Gulf Coast District is hereby readopted and amended as follows:

Rule 2. Not more than One Hundred Sixty Eight Thousand Seven Hundred Seventy Four (168,774) bbls. of oil (word illegible) shall be produced from said fields of said District during any day of the effective period of this Order, which shall be distributed to said fields as follows:

Allen Dome	15	Louise	1540
Anahuac	5000	Manvel (Miocene)	4000
Ariola	1375	Manvel (Oligocene)	3500
Bay City	500	Markham	1105
Big Creek	1043	Mykawa	280
Blue Ridge	1675	Mykawa (New)	3847
Boling	870	Nash Dome	38
Brenham	18	North Dayton	142
Brookshire	15	Old Ocean	424
Buckeye	174	Orchard	675
Batson	729	Orange	690
Batson (New)	1236	Pickett Ridge	900
Barbers Hill	17200	Port Neches	1805
Clay Creek	1133	Pierce Junction	3279
Cleveland	853	Pierce Junction (Vicks-	
Conroe	44025	burg	70
Damon Mound	482	Raccoon Bend	2883
Dickinson	1465	Raccoon Bend (Cock-	
Esperson Dome	1340	field)	1931
Fannett	973	Rockland	-0-
Goose Creek	2745	Saratoga	839
Gillock	(shut in)	Schwab	60
High Island	6780	South Houston	1153
Hankamer	1603	Sugarland	5580
Hankamer (New)	491	Sour Lake	1577
Hardin	365	South Liberty	685
Hastings	5200	Spindletop	2377
Hull (Old)	2825	Thompson	10738
Hull (New)	2846	Tomball	6250
Humble	3430	West Columbia	2340
Livingston	3100	Turtle Bay	150
Lost Lake	260	Withers	150

It is Further Ordered that allowable oil in the foregoing order is oil measured on 100 per cent tank tables according to the Pipe Line Rule Number Nine (9) and corrected to sixty (60) degrees Fahrenheit.

It is Further Ordered that this Cause be held open on the docket for such further orders as may be necessary and supported by evidence of record in above Cause.

RAILROAD COMMISSION OF  
TEXAS.

(Seal)

ERNEST O. THOMPSON,

Chairman.

C. V. TERRELL,

Commissioner.

LON A. SMITH,

Commissioner.

Attest:

C. F. PETET, Secretary.

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EXHIBIT No. 49.

Railroad Commission of Texas.

Oil and Gas Division.

Oil and Gas Docket Nos. 108; 120, 123, 124, 125, 126, 128,  
129, 132 & 146.

In Re: Conservation and Prevention of Waste of Crude  
Petroleum and Natural Gas in the State of Texas.

Austin, Texas, March 23, 1936.

Special Order Fixing the Allowable Production of Crude  
Oil in the Various Fields and Districts in Texas.

Whereas, after due notice hearings have been held at  
Austin, Texas, at various times, including hearing on

March 18, 1936, with respect to the existence and imminence of waste of oil and gas in the State of Texas, and the prevention thereof; and

Whereas, in view of the evidence, including among other matters the physical conditions in the various fields, the transportation and marketing facilities, the reasonable market demand, the reasonableness of the allocation as between fields of the allowable production under previous orders; and

Whereas, the Railroad Commission of Texas finds from the evidence that the reasonable market demand for oil produced in this State from the various fields and districts therein equals the amount hereinafter shown as the allowable production thereof during the period beginning at 7 o'clock a. m., April 1, 1936, and ending at 7 o'clock a. m., May 1, 1936; and

Whereas, the Railroad Commission of Texas finds that waste exists or is imminent and that to prevent such waste of oil and gas, as the same is defined by the applicable Statutes, it is necessary to restrict the production of oil in the State of Texas as provided for herein, and

Whereas, The Railroad Commission's Special Order Fixing Allowable Production of Crude Oil in the Various Fields and Districts in Texas, dated August 26, 1935, contains the following language:

"We further find from the evidence the more wells that are drilled the greater will be the ultimate recovery of oil and gas from any given pool."

By this language the Commission did not mean and did not find from the evidence that the closer wells are drilled the greater will be the ultimate recovery of oil and gas

from any given pool, but by such language only meant and found from the evidence that the more wells that are drilled *in conformity with the spacing rules* as applicable to the various fields in Texas the greater will be the ultimate recovery of oil and/or gas from any given pool.

It was not then the intention and is not now the intention of the Railroad Commission to abrogate or abandon any of the spacing rules now in effect and applicable to the various oil and gas fields in Texas, nor to militate against the fact basis on which the Commission's spacing rules are based.

Now, Therefore, in order to prevent the waste of oil and gas in the State of Texas, which will take place by authorizing production over the said period in excess of the reasonable market demand;

It is Hereby Ordered that beginning at 7 o'clock a. m., Wednesday, April 1, 1936, and continuing to May 1, 1936; unless other periods are prescribed herein, the production of oil in the State of Texas, and the various fields therein, until further ordered, shall not exceed the amounts hereinafter shown as the allowable production thereof, and in order to adjust the current allowable production of crude oil in Texas, as nearly as may be, to the demand as shown, the allowable daily production of the various fields and districts in said State shall be limited to the amounts hereinafter specified and the following orders fixing such limitation on production in the various fields and districts are hereby adopted.

1. Rule 2 of Division 2 as contained in an order of this Commission dated October 17, 1933, pertaining to the Panhandle District of Texas is hereby readopted and amended as follows:

Rule 2. Not more than Sixty Thousand Eight Hundred (60,800) barrels of crude oil shall be produced from said sitrict during any day of the effective period of this Order. Moore County shall not produce in excess of Fifteen Hundred (1500) bbl. per day. Moore County allowable is additional to Panhandle allowable. The Osborne Area in Wheeler County shall not produce in excess of One Thousand (1,000) barrels per day. The Osborne Area allowable is in addition to the Panhandle allowable.

2. Rule 23 (a) of Division 3, as contained in an order of this Commission dated October 17, 1933, pertaining to the East Texas Field is hereby readopted and amended as follows:

Rule 23 (a). Whereas, The Railroad Commission of Texas finds from evidence submitted to it at a hearing held in Austin, Texas, on March 18, 1936, and at previous hearings held before this regulatory body, that the reservoir of the East Texas Field has its energy supplied by a hydrostatic drive which encroaches from the west to the east, and only a certain amount of crude oil can be withdrawn daily from the East Texas reservoir in order to utilize to the greatest extent the energy necessary for the production and recovery of the greatest amount of oil ultimately from the reservoir. It has been recommended to the Commission by competent engineers that not more than 425,000 to 450,000 barrels of crude oil should be allowed to be produced from the East Texas reservoir in any one day in order that the reservoir might be depleted with the least amount of waste incurring. Evidence was also submitted to the Commission at these hearings that the production of from 425,000 to 450,000 barrels of crude oil will prohibit the coning of water; the uneven encroachment of water, and the subsequent trapping of much oil that otherwise, under higher daily allowables of crude oil, would not be recovered.

Therefore, it is Further Ordered by the Railroad Commission of Texas, that during each twenty-four (24) hour period beginning at 7 o'clock a. m., Central Standard Time, April 1, 1936, the owner or operator or manager of each well in the East Texas Field shall be permitted, either collectively or individually, to produce daily from each well a maximum of Two Point Eighty Five, (2.85%) Per Cent of its average hourly potential producing capacity as determined by the Commission.

3. Rule 2 of Division 5, as contained in an order of this Commission dated October 17, 1933, pertaining to the North Texas District is hereby readopted and amended as follows:

Rule 2. Not more than Sixty Thousand (60,000) barrels of crude oil shall be produced from said district during any day of the effective period of this Order. Foard County shall not produce in excess of Five Hundred (500) barrels daily. Foard County allowable is in addition to North Texas allowable.

4. Rule 2 of Division 5, as contained in an order of this Commission dated October 17, 1933, pertaining to the West Central Texas District is hereby readopted and amended as follows:

Rule 2. Not more than Fifty Three Thousand and Eight (53,008) barrels of crude oil shall be produced from said District during any day of the effective period of this Order, which is distributed to the various counties as follows:

Brown .....	1727	Palo Pinto .....	360
Callahan .....	1596	Reagan (Big Lake) ..	9000
Coleman .....	1172	Reagan (Grayson) ...	172

Comanche .....	74	McCullough .....	1
Crockett (Todd) .....	10	Runnels .....	313
Crockett (World) .....	1060	Shackelford .....	6477
Eastland .....	2936	Stephens .....	4653
Erath .....	112	Throckmorton .....	464
Fisher .....	5875	Taylor .....	126
Haskell .....	18	Upton (McCamey) ...	8782
Irion .....	42	Young South/2 .....	4323
Jones .....	3653	Webb-Ray .....	62

5. Rule 4 of Division 7, as contained in an order of this Commission dated October 17, 1933, pertaining to the West Texas District is hereby readopted and amended as follows:

Rule 4. Not more than One Hundred Fifty Three Thousand Four Hundred Six (153,406) barrels of crude oil per day shall be produced from said District during any day of the effective period of this Order, which shall be distributed to the various fields therein as follows:

Bashara .....	22	McKinzie .....	5
Brown-Altman .....	1389	Monroe .....	25
Church-Fields .....	6960	Netterville .....	99
Cowden, North .....	6350	Northwest .....	28
Cowden, South .....	400	Parker .....	50
Crane-Cowden .....	572	Pecos Valley .....	422
Deep Rock .....	350	Penwell .....	6718
Dobbs .....	100	Richards .....	10
Edwards .....	16	Sand Hills .....	240
Emperor .....	515	Sand Hills (Ordovician)	60
Foster .....	180	Sayre .....	4350
Fuhrmans .....	750	Scarbrough .....	1885
Goldsmith .....	414	Sealey (1st no. illegi-	
Gulf-McElroy .....	4610	ble) .....	535
Halley .....	149	Shipley .....	1580

Harper .....	96	Tobarg .....	2200
Hendricks .....	13815	Taylor-Link .....	1350
Howard-Glasscock ..	20000	Waddell .....	2012
Iaatan-E. Howard ..	4,800	Walker .....	10
Johnson .....	30	Ward, North .....	10075
Keyes .....	100	Ward, South .....	14170
Keystone .....	1268	Westbrook .....	867
Leck .....	500	Wheat .....	1850
Masterson .....	211	White & Baker .....	3
Means .....	1466	Yates .....	38837
McClintic .....	932		

6. Rule 2 of Division 4, as contained in an Order of this Commission dated October 17, 1933, pertaining to the East Central Texas District is hereby readopted and amended as follows:

Rule 2. Not more than Fifty Thousand Nine Hundred Fifty (50,950) barrels of crude oil per day shall be produced from said fields in said District during any day of the period of April 1, 1936, to May 1, 1936; said amounts shall be allocated to the various fields in the following amount:

Bethany .....	16	Pottsboro .....	4
Boggy Creek .....	573	Rusk .....	225
Camp Hill .....	660	Richland .....	28
Cayuga .....	5274	Powell .....	2321
Curry .....	127	Rodessa .....	1200
Corsicana .....	411	South Bosque .....	11
East Freestone .....	8	Van .....	35733
Long Lake .....	750	Van Shallow .....	153
Mexia .....	2187	Trinity .....	1091
Post Oak .....	1	Wortham .....	95
Potter .....	70	Worthem (Shallow) ..	12

7. Rule 2 of Division 8, as contained in an order of this Commission dated October 17, 1933, pertaining to the

Southwest Texas District is hereby readopted and amended as follows:

Rule 2. Not more than One Hundred Forty Three Thousand Two Hundred Sixty Three (143,263) barrels of crude oil shall be produced in said District during any day of the effective date of this Order, and same shall be distributed as follows:

### Division I.

Aita Vista .....	5	Larremore .....	40
Bateman .....	206	Loma Alto .....	80
Bob Rose .....	25	Lowe .....	-0-
Buchanan .....	39	Luling-Branyon .....	5923
Callaham .....	148	Lytton-Springs .....	371
Carröll .....	28	Manford .....	33
Cedar Creek .....	44	Matthews .....	52
Cedar Creek (N) .....	54	Meaders .....	-0-
Chapman-Abbott .....	333	Minerva Rockdale .....	227
Chicon Lake .....	17	Noack .....	325
Clark .....	500	Pearsall .....	1000
Cooksey .....	12	Schimmel-Batts .....	1
Darst Creek .....	8986	Somerset .....	700
Dale .....	160	Southton .....	67
Dunlap .....	10	Staples .....	3
Eckert .....	269	Taylor Ina .....	5
Espada Mission .....	1	Thrall .....	46
Gas Ridge .....	8	Salt Flat .....	4268
Hilbig .....	791	Von Ormy .....	83
Jones .....	-0-	Yeast .....	50
Jacobs .....	610	Zoborski .....	4
Kimbro .....			
Kimbro (New) .....	48		
			<hr/> 25572

## Division II.

Caesar	1293	Placedo	2050
Coletta Creek	780	Pettus	1408
Diamond Hall	80	Pettus (New)	1000
Dinero	92	Port Lavaca	700
Dirks	5280	Quintanna-O'Connor	3200
Fort Merrill	57	Ray	1831
Greta	14930	Refugio (Deep Sand)	111
Greta Deep	1180	Refugio (New)	2325
Keeran	300	Refugio (Old)	2520
McFadden	26	Hords Creek	90
Maritz	150	Tuleta	1400
McNeil	122	Vanderbilt	100
Mineral	-0-	Worthington	74
Mt. Lucas	60	Whittington	6
Normanna	12		
O'Connor-McFadden	275		41452

## Division IV.

Albercos	100	Loma Vista	75
Alworth	-0-	Lopez	2520
Angelita	-0-	Los Olmos	146
Aviators	408	Mercedes	140
Baldwin	874	Mirando City	351
Barbacosa	15	Mirando Valley	32
Bruni	2200	Moca	666
Carolina-Tex	5	O'Hern	2800
Charco Redondo	10	Piedra Lumbre	360
Clara Driscoll	150	Piedra Pintas	-0-
Cole East	32	Plymouth	8130
Cole West	593	Premont Prospect	-0-
Cole Middle	56	Randado	320
Cuella	114	Rio Grande City	235
Comitas	10	Roma	3
Driscoll	360	Corpus Christi	4306

Eagle Hill .....	426	Sinton .....	10
Escobas .....	1109	Seven Sisters .....	3500
Gov't Wells (N) .....	11704	S. R. C. ....	26
Gov't Wells (S) .....	6021	Sam Fordyce .....	5126
Guerra .....	412	Sarnosa .....	957
Hagist .....	50	Saxet (Old) .....	2195
Henne-Winch-Farris ..	10	Saxet (New) .....	6180
Hoffman .....	340	South Clarkwood ..	20
Jennings .....	655	Taft .....	300
Kingsville .....	60	White Point .....	20
Kohler .....	97		
Laurel .....	40		76,239
Loma Nova .....	11970		

8. Rule 2 of Section A, Division 8, as contained in an order of this Commission dated October 17, 1933, pertaining to the Gulf Coast District is hereby readopted and amended as follows:

Rule 2. Not more than One Hundred Seventy Nine Thousand and Thirty Four (179,034) barrels of crude oil shall be produced from said fields of said district during any day of the effective period of this Order, which shall be distributed to said fields as follows:

Amelia .....	150	Livingston .....	3188
Allen Dome .....	16	Manvel (Miocene) ...	5000
Anahuac .....	5900	Manvel (Oligocene) ..	4500
Ariola .....	1375	Markham .....	1371
Bay City .....	750	Mykawa .....	229
Big Creek .....	1006	Mykawa (New) .....	3927
Blue Ridge .....	1555	Nash Dome .....	36
Boling .....	735	North Dayton .....	133
Brenham .....	19	Old Ocean .....	424
Brookshire .....	15	Orchard .....	628
Buckeye .....	218	Orange .....	680
Batson .....	743	Pickett Ridge .....	1050

Batson (New) .....	1497	Port Neches .....	1805
Barbers Hill .....	17200	Pierce Junction .....	3315
Clay Creek .....	1133	Pierce Junction (Vicks-	
Cleveland .....	962	burg) .....	70
Conroe .....	46025	Raccoon Bend .....	2883
Damon Mound .....	497	Raccoon Bend (Cock-	
Dickinson .....	1565	field) .....	3000
Esperson Dome .....	1340	Rockland .....	-01
Fannett .....	1013	Saratoga .....	973
Goose Creek .....	3053	Schwab .....	60
Gillock .....	(shut in)	South Houston .....	1425
High Island .....	6780	Sugarland .....	5580
Hankamer .....	1801	Sour Lake .....	1572
Hankamer (New) .....	587	South Liberty .....	646
Hardin .....	365	Spindletop .....	2507
Hastings .....	5900	Thompson .....	10738
Hull (Old) .....	2915	Tomball .....	7500
Hull (New) .....	2710	West Columbia .....	2340
Humble .....	3430	Withers .....	150
Lost Lake .....	200	Turtle Bay .....	300
Louise .....	1540	Shepherd's Mott .....	9

It is Further Ordered that allowable oil in the foregoing order is oil measured on 100 per cent tank tables according to the Pipe Line Rule Number Nine (9) and corrected to sixty (60) degrees Fahrenheit.

It is Further Ordered that this Cause be held open on the docket for such further orders as may be necessary and supported by evidence of record in above Cause.

RAILROAD COMMISSION OF  
TEXAS.

ERNEST O. THOMPSON,

Chairman.

C. V. TERRELL,

Commissioner.

LON A. SMITH,

Commissioner.

Attest:

C. F. PETET, Secretary.

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## EXHIBIT 50.

= 1 R. M. Wood 1 Acre, W. H. Castleberry Survey, Gregg County.

Case No. 21,418. Rule 37.

Applicant: R. M. Wood, c/o Jack Hearrell, Gladewater, Texas.

The application of R. M. Wood for an exception under the provisions of Rule 37 coming on to be heard on the 18th day of December, 1936, by the Railroad Commission of Texas, and it appearing that the petition shows good cause; that no injustice will be done by the granting of such exception, and that same should be granted to prevent confiscation of property:

Now, therefore, it is Ordered that the application of R. M. Wood for an exception under the provisions of Rule 37 and a permit to drill well No. 1 on the R. M. Wood 1 acre tract on the W. H. Castleberry Survey, Gregg County, Texas, as shown by plat submitted, is hereby approved, and applicant is granted permission to drill well No. 1, to be spaced as follows:

30 feet north of the south line;

50 feet west of the east line.

Entered at Austin, Texas, on this the 23 day of Dec., 1936.

ERNEST O. THOMPSON,

Chairman,

C. V. TERRELL,

Commissioner,

.....  
Commissioner.

Attest:

C. F. PETET,

Secretary.

(Seal)

The above and foregoing is a true and correct copy of an order of the Railroad Commission of Texas entered on the above date.

LATEN STANBERRY,  
Chief Supervisor.

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## EXHIBIT 51.

Motion For Rehearing

By

Shell Petroleum Corporation.

Case No. 21,418. Rule 37.

Applicant: R. M. Wood, c/o Jack Hearrell, Gladewater,  
Texas.

Motion for rehearing in the above styled case having been this date considered by the Railroad Commission of Texas, and it appearing that the reasons set out in said motion are sufficient to justify the granting of a rehearing covering the application of R. M. Wood for special permit to drill well No. 1, R. M. Wood one-acre tract, W. H. Castleberry y in Gregg County, Texas:

Now, therefore, it is Ordered that the motion for rehearing filed by Dan Moody, Attorney for Shell Petroleum Corporation, in the above styled case, is hereby granted.

Entered at Austin, Texas, on this the 21st day of January, 1937.

C. V. TERRELL,

Chairman,

LON A. SMITH,

Commissioner,

ERNEST O. THOMPSON,

Commissioner.

Attest:

C. F. PETET,

Secretary.

(Seal)

The above and foregoing is a true and correct copy of an order of the Railroad Commission entered on the above date.

LATEN STANBERRY,

Chief Supervisor, Oil and Gas  
Division.

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# EXHIBIT 52.

Permit Reaffirmed.

=1. R. M. Wood, 1 Acre Tract, W. H. Castleberry Survey,  
Gregg County, Texas.

Case No. 21,418. Rule 37.

Applicant: R. M. Wood, c/o Jack Hearrell, Gladewater,  
Texas.

Whereas, on December 23, 1936, the Railroad Commission of Texas after hearing and due consideration of the application of R. M. Wood for special permit to drill well No. 1, R. M. Wood one-acre tract, W. H. Castle-

berry Survey, Gregg County, Texas, granted to applicant a permit to drill said well No. 1, and

Whereas, on February 11-12, 1937, a rehearing was held on this application at which sufficient evidence did not exist to justify the cancellation of the above permit:

Now, therefore, it is Ordered, that the permit granted to R. M. Wood dated December 23, 1936, to drill well No. 1, R. M. Wood one-acre tract, W. H. Castleberry Survey, Gregg County, Texas, as shown by plat submitted, be reaffirmed, and applicant granted permission to drill well No. 1 to be spaced as follows:

30 feet north of the south line, and  
50 feet west of the east line.

Entered at Austin, Texas, on this the 4th day of March, 1937.

C. V. TERRELL,

Chairman,

ERNEST O. THOMPSON,

Commissioner,

LON A. SMITH,

Commissioner.

Attest:

C. F. PETET,

Secretary.

FINDINGS OF FACT AND CONCLUSIONS OF  
LAW.

(Title Omitted.)

The following findings of fact and conclusions of law are directed to be filed by the Clerk in accordance with the rules of this Court:

## Findings of Fact.

1. The East Texas oil field or pool is a common reservoir. It was discovered in the Fall of 1930. It consists of an oil saturated portion of a stratum or deposit of sand known as the Woodbine sand, and, considering surface area, the field now covers approximately 133,000 acres located in Upshur, Gregg, Smith and Rusk Counties. It is approximately forty miles in length, with an average width of some four miles.

2. According to the geologists, many years ago there was a great land mass, known as the Sabine Uplift (roughly corresponding to the Florida Peninsula) which was the eastern limits of an ancient sea. In course of time, sands and other minerals were washed from the high lands into the sea, forming a beach very similar to the beaches along the Gulf Coast. No doubt a small amount of materials other than sand, such as volcanic ash and shales, were deposited in the sea itself, becoming mixed in the sand body. This sand deposit covered an earlier, impervious formation called the Georgetown lime. Later the entire area sank, and was covered by another impervious formation called the Austin Chalk, and then by other formations, not necessary to identify, which extended on up to the surface.

3. The Woodbine sand in the oil field or pool is now found some 3600 feet below the surface. The sand pinches out at the eastern limit of the Woodbine formation, or at the extreme edge of the shore line of the ancient sea, and extends westward in varying thickness for many miles, and with a downward dip near the old shore line where the oil is found. The Woodbine sand body was at various points folded and buckled ages ago, leaving the western end exposed at the surface at the present time. This outcrop at the surface, exposed to water infiltration, covers a large area some 150 miles to the north and west of the field, roughly represented by a line running from Waco north between Fort Worth and Dallas, then north and east to Paris.

4. The Woodbine sand stratum or deposit is a huge porous medium or reservoir or sand body with the high end west of Dallas, and with the low end forming the East Texas oil producing zone. There is a difference in elevation of at least 3,000 feet between the upper and lower ends. The formation resembles a great distorted "U" tube, with the eastern or oil-pool end much smaller than the broad, wide-mouthed western end which is exposed at the surface or at the outcrop. The Woodbine sand is essentially a water sand, the water forming a hydrostatic head having a virgin pressure of about 1600 pounds per square inch in the oil producing zone in the East Texas field. The oil pool is, therefore, an accumulation of oil in the pore spaces of the eastern limits of the Woodbine sand. The oil is trapped in the sand by the Austin Chalk above, by the Georgetown Lime below, both impervious formations, and by salt water which is in the Woodbine section. The water is under approximately the west one-half of the pool, and extends, of course, throughout the sand to the west of the pool, and on to the surface.

5. The column of water which is in the Woodbine sand, being in contact with the oil itself, exerts a hydrostatic pressure, which, at the discovery of the pool, amounted to about 1600 pounds per square inch. The oil bearing portion of the sand, seen in cross section from east to west, resembles a triangle; the long or top side of which is a portion of the Austin Chalk; the eastern leg is a portion of the Georgetown Lime; and the lower or western leg is the water contact. It follows that the sands along the eastern edge of the field are thin. Going westward the oil saturated sands become thicker, reaching a maximum thickness in the center of the oil pool of about 100 feet. Going further westward along the lower leg of the triangle along the line of oil-water contact, the oil saturated portion of the sand becomes thin, until the western edge of the field is reached where nothing but water is found. A line drawn more or less through the center of the field, from north to south, passes through the area of maximum thickness of the oil saturated sand, and is more or less the center of what is called the "fairway", or the best part of the field.

6. Being a common reservoir, the fluids therein migrate rather freely, with possible exception of a few small areas of no consequence with respect to issues here involved. Furthermore, pressure is readily transmitted from one point to another, and always there is an adjustment of pressures in the seeking of an equilibrium. The reservoir fluids move, of course, from high pressure areas to low pressure areas. While in some portions of the pool the sand is more porous, and more permeable than in others, and while in some portions there are found volcanic ash, shale and other materials in different quantities and in different locations than in other portions of the field, it may be said that, on the whole, the Woodbine sand

is fairly uniform, having an average porosity of about 25%, and with relatively uniform saturation of oil. A large number of cores or sections of the oil saturated sand have been examined, and the shale or ash or other non-porous substance found in one core is not always found in another, or not found exactly at the same level as in another; and an area of tight sand in one core is not found at the same location as in other cores; however, aside from these variations, which are to be expected, the porosity in the different cores is on the average rather uniform, and particularly so in any given area of the field. The present potential map of the Commission, hereafter explained, from which well allowables are calculated, certainly reflects no lack of uniformity in these conditions. Indeed, the map, contoured from a few key wells, necessarily assumes a high degree of uniformity over wide areas and distances.

7. While the extreme edges of the field offer some complications not encountered elsewhere, but which can be reasonably predicted and which are not of real importance here, considering the field as a whole, it appears definitely that data are now and have been available for some years from which it is possible to determine with reasonable accuracy the character and thickness of the sands, the type of well which will be obtained in any given area, and the recoverable oil in the field as a whole. Some 26,000 well logs have been filed with the Railroad Commission by the operators, numerous Schlumberger tests, which are now considered to be very accurate, have been taken, and this information has been disseminated generally by way of periodicals, papers, surveys made by the Bureau of  
936 Mines, and the like. It is clearly established that an excessive allowable for the field, say 1,000,000 barrels a day, will result in a lower ultimate recovery than that which would occur under a smaller allowable

of some 500,000 barrels a day. The parties do not attack, however, the top allowable of 522,000 barrels a day, but there was, notwithstanding, one witness for the State who testified that the daily allowable could be materially increased without causing substantial waste, but such witness admitted that he was one of a very few who had such an opinion and he was not expressing the views of the Commission or its engineers. In any event, complainant and defendants agree that there is no issue with respect to the top allowable, and proof as to the necessity of maintaining an allowable of some 500,000 barrels or less a day has not been fully developed. Since it is generally admitted that excessive production will cause waste, estimates of recoverable oil have necessarily been based on a definite assumption of the general producing conditions which will prevail. In short, a wealth of information is already before the Commission from which it can determine the productivity, or at least the relative productivity, of the various leases in the field, in terms of relative recoverable oil under practical operating conditions.

8. The East Texas field is essentially a water drive field, and will be such until pressures become so low that gas will generally come out of solution, which is to say that the pressure of the column of water in the Woodbine sand, a hydrostatic pressure, tends to force the fluids from the reservoir to the surface. When a well is opened for production a differential pressure is created which causes the fluids to move to the points of least resistance. The hydrostatic pressure, plus expansion of gas, cause most of the wells to flow. If large quantities of fluid are removed, as in 1933 and  
 937 in the early days of the field, the pressure drop is considerable, extending in varying degrees from the well bore back into the reservoir. Since the hydrostatic head of water is to the west of the field,

and water is under the western one-half, the pressure is greater along the west side of the field than it is along the east side, resulting in what is called a pressure gradient from west to east across the field, being lower on the east. As fluids are withdrawn there is a slight expansion of the reservoir contents and a gradual encroachment of the water which occupies the remaining space not taken by expansion. There is a tendency for the water table to rise or encroach gradually as fluids are removed; consequently, after the recoverable oil has been removed, the reservoir space occupied by the oil and its dissolved gas will be occupied by the salt water. Due to some variations, in places, in the porosity of the Woodbine sand, and due to variations in permeability, but particularly to a number of areas where there have been concentrated withdrawals, the water table has not advanced upward and eastward as an absolutely level table, for it is higher in some places than others; but, for all practical purposes, it may be said that the water table is rising in a plane, or as a table, gradually making non-productive of oil the areas along the west edge of the field. Gradually the thickness of the productive sands is decreasing as the water table rises. Furthermore, under open flow production, or under almost any plan of production which permits the production of wells in commercial quantities over the entire field at the same time, the movement of oil up structure from west to east will take place. Such movement could, it seems, be prevented by drilling wells along the western edge, producing them until drowned out, then, drilling again further up structure, and repeating this procedure,

938      until finally the eastern edge of the field was reached. Obviously, such a program is not feasible, for operators up structure would have to wait for years before having any production, foregoing present income, to say nothing of losing leases. Any practical plan, with all wells producing reasonable

amounts, will cause oil to move in some degree up structure, but not as much so as the present plan or order. For this reason, operators along the west edge of the field are not as advantageously situated as those up structure, and the wells in the west will sooner or later be drowned out by encroaching water, while wells to the east will still produce. Position on structure, thickness of sands, and distribution of allowable, all enter into ultimate recovery from any lease or area. Natural advantage can be changed, either increased or decreased, by the method of distribution of production. The present per-well method does not reduce avoidable drainage to a reasonable minimum. By such method, reasonably avoidable drainage is aggravated, and to the material damage of complainant.

9. While on the whole the pressure gradient is high on the west and low on the east, and while the reservoir fluids on the whole tend to move up structure, there are exceptions which are most important. For instance, there are many areas where drilling is dense, and relatively the withdrawal of reservoir fluids (oil, water and gas) is much higher than elsewhere. These regions of concentrated withdrawals cause low pressure areas which in turn cause migration of oil to such areas. The migration in such an instance is not limited to an up structure movement. Oil will move down structure, and in fact in any direction, to a low pressure area. There are many areas to the west, and in fact in all directions, of complainant's tract, which are more densely drilled and where pressures are lower. Obviously, complainant's ultimate recovery will be materially reduced by such conditions, largely caused by the drilling pattern and method of distribution.

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10. The field was rapidly developed by a large number of operators. The original orders

of the Railroad Commission, undertaking to regulate production, provided for proration units, and encouraged rather wide spacing by giving substantial value to acreage in the formula for distributing the allowable. However, beginning with the order of September 2, 1931, the Commission began its series of orders providing for distribution of the allowable production solely on the flat per-well basis. Each well, regardless of its size, or the area of the tract upon which it was situated, was given the same allowable production. The validity of the orders limiting production in the field was involved in many suits over a period of several years. There were several grounds for the attacks, not necessary to mention, but they included invalidity based on the per-well method of distribution. The complainant, in March, 1933, attacked the validity of the order because the same was on a well basis, and a few months later, attacked another order based on potentials calculated from a few key wells, and at that time there were substantially less than 10,000 wells in the field and the drilling pattern and density were quite different from those which exist today. Temporary injunction was denied, and the case was not tried on its merits.

11, The first order based on potential was in April, 1933, and the field was placed on a "per-well-potential" method. The potentials from which to calculate potentials of other wells, were taken on about 75 wells, and even these were not wide open-flow potentials all taken at the same time, but were taken over a three-hour period as they tested each well. In selecting the key wells, the Commission picked them right down the center of the field. The wells were selected with reference to their uniform mechanical condition as nearly as possible. In the event some of the wells made potentials that were not thought to be in reasonable relation to the others, these tests were thrown out and a search would begin to find other

wells which would come up to what were expected of them. The Commission then contoured the field on lines of equal potential. Its engineers, in selecting key wells, avoided coming too close to the western edge of the field because the sudden rapid production of wells there might cause them to produce water. It was necessary, therefore, for the engineers, in order to draw contour lines for the edges of the field, to space evenly and contour lines from the last point of control over to the western edge, and as they were contouring in hundred barrel contours, they equally so spaced their lines. If they were a mile from the western edge, they divided that mile into five equal parts and stepped down from a potential of 500 barrels a well to 0 barrels in even steps, and likewise the same thing was done on the eastern side of the field. Such a method of fixing potential contour lines was, however, resorted to on the eastern side not on account of water, but because most of the wells there were small wells, pumping wells, or wells equipped with small flow lines, and the operators were not willing to put their wells up for a test as representative of that test. Likewise, on the east side of the field, the last point of control was anywhere from one-half to three-quarters of a mile from the eastern extremity of the field, and contours were spaced accordingly, and so, the Commission made its early potential map. Later, some wells were completed by drilling deep into the sand in order to get the highest potential, since the depth of penetration into the sand controlled, to a substantial extent, the potential of a well. For further data to be used for the potential contour map, few potentials have been taken since 1933, but the contour lines on the east and west have remained substantially the same. The most that can be said of a potential is that it reflects accurately only the mechanical efficiency of a well to produce at the time and under the conditions existing when the test was made.

Relatively, it may indicate in some small way other factors. Pressure is truly represented by bottom hole or depth pressure tests, which the Commission takes monthly. During the first eight years, the pressure dropped about 515 pounds. Two potential tests taken on wells on adjoining tracts, where the sand and other reservoir conditions are substantially the same, will show substantially the same potential only where like equipment is used, the same penetration is made into the sand, and the same back pressure maintained on the wells when the tests are made. Wells throughout the field are equipped and drilled differently. The potentials as taken and calculated in the East Texas field are, therefore, fictitious to a great degree, even with respect to reflecting the mechanical ability of the well to produce. They do, however, serve as some slight basis for a comparison of wells in the field, but the contour lines, as shown in many places on the contour map used for ascertaining allowables, do not reflect the real potentials of a great number of wells in the field. For illustration, one witness testified that about six months prior to the trial of this case, he was employed to check 156 wells lying on the east side of the field around the town of Joinerville in the Isaac Parker Survey. By the contour map, a majority of the wells checked were given between 100 and 200 barrels an hour potential, and the rest of them between 100 and 0, yet not one well out of the 156 was capable of making 20 barrels during a period of twenty-four hours. Many of the wells on the east side, which are on the pump, were given a potential of 200 to 300 barrels an hour, whereas there is no machinery used in the field capable of pumping 300 barrels an hour. After the potentials were taken for the drawing of a contour map, contour lines were

942 drawn and the properties within the contour lines were assigned arbitrarily a potential based upon the potential of the wells through which the con-

four lines were drawn. If an operator felt aggrieved, he could request a potential to be taken for his well, and the Commission would make an adjustment accordingly; but where his grievance was that his potential was accurate, but he was suffering confiscation by virtue of numerous other wells in the field having too high potentials, or being given allowables which were too high, the privilege meant nothing. Having prepared the contour map, a schedule was then compiled by the Commission, giving the names of the operators, the leases, surveys, and counties in which the wells were located, the number of each well, and its potential, and then, in either the front or the back, was contained a key system whereby one could look up the potential to see what the daily allowable of that particular well would be. The proration order, as interpreted by the Commission, plus the determination of potentials, plus the schedules showing wells and potentials, as determined by the Commission, all constitute the plan or method of distributing the allowable production for the field. The order, or more accurately, the plan of distribution of allowable for the field, has never attempted for several years to take into account the surface acreage in any lease or its oil reserves. Generally, where the wells were drilled and equipped the same, a well on one-tenth of an acre, adjacent to a tract with one well on ten acres, had exactly the same potential and was given by the Commission the same potential and allowable. Thus, such a well on one-tenth of an acre, under the order of the Commission, has been permitted to produce approximately one hundred times as much as a similar well on a ten acre tract.

12. The 71 key wells which are now used are distributed substantially as the original wells were. To a large degree, the original map is still used, revised somewhat after subsequent tests. The method of contouring

943 and the method of determining potentials of wells from their location with respect to contour lines drawn as stated, necessarily assumes reasonable uniformity in sand conditions between contour lines and between wells on the same contour. If there is a variance in sand conditions, as contended by respondents, then certainly the contour lines, as drawn by the Commission, give no indication whatsoever of same. However, the arbitrary giving of potentials to the weaker wells of many times more than their actual producing capacities became unimportant, because when each well which could make it was given 20 barrels per day, there were only some 7,000 barrels a day to be allocated among the better wells in the field. The pertinent part of the order and its application is very clearly reflected by the following stipulation between the parties:

"1. The total daily allowable for the East Texas field as fixed by the Railroad Commission order in force at the time of trial was about 522,500 barrels of oil.

"2. The order promulgated by the Railroad Commission and in force at the time of trial for the proration of this field allowable among the wells in the field provided: 'the owner or operator or manager of each well in the East Texas field shall be permitted, either collectively or individually, to produce daily from each well a maximum of two and thirty-two hundredths (2.32) per cent of its hourly potential capacity as determined by the Commission.'

"3. In the application and enforcement of the above proration order (a) each well that could not produce as much as 20 barrels of oil per day was allowed to produce the maximum amount that it could produce; (b) where 2.32% of the hourly potential of any well would amount to less than 20 barrels per day, the well was

allowed to produce 20 barrels of oil per day; (c) where 2.32% of the hourly potential of any well would amount to more than 20 barrels of oil per day, such well was allowed to produce 2.32% of its hourly potential.

"This application of the order resulted in the following: Approximately 451 wells, not any one of which was capable of producing as much as 20 barrels per day, were allowed to produce daily a total of approximately 5,250 barrels. Approximately 19,032 wells whose individual hourly potential when multiplied by 2.32% amounted to less than 20 barrels, were each allowed to produce a full 20 barrels per day; or from all of such wells a total of approximately 380,640 barrels per day. These were wells whose hourly potential ranged anywhere from 1 barrel to 860 barrels per hour. Approximately 6,325 wells whose individual potential when multiplied by 2.32% amounted to more than 20 barrels were each allowed to produce daily that number of barrels which equaled the product of its hourly potential multiplied by 2.32%. The total daily production from these wells was approximately 136,610 barrels. These wells had an hourly potential ranging from 865 barrels per hour to about 1,100 barrels per hour. In practical operation, the daily allowable of no well was controlled by the factor 2.32% of its hourly potential unless such well had a potential of 865 barrels or more per hour.

"The plaintiff offered testimony to show that if each well in the field that could not make 20 barrels per day was allowed to produce the maximum which it was capable of producing, and if every well in the field that was capable of making 20 barrels per day was allowed to produce 20 barrels per day, that the aggregate of such production amounted to some 510,000 or 515,000 barrels of the daily allowable of approximately 522,500 bar-

rels, with the result that only about 7,000 to 12,000 barrels of the total daily production was in the practical application of the order of the Commission prorated on the factor of 2.32% of the hourly potential of the wells.

4. The testimony shows that the wells were shut down on Saturdays and Sundays and were allowed to produce only five (5) days each week and the figures referred to in the testimony were for the days on which the wells were allowed to produce."

Furthermore, as far as effect is concerned, it is immaterial whether it be said that the Commission arbitrarily increased potentials so that each well be allowed to produce as much as 20 barrels if allowed to produce 2.32% of its assigned potential, or whether, ignoring the potentials, each well was given as much as 20 barrels. It is clear that in practice, and as part of the program of limitation, of allowable and distribution thereof, each well was authorized to produce 20 barrels if it could do so, and this left a small amount for the better wells and properties.

Although the amount to be allocated on a potential basis was stipulated as 7,000 to 12,000 barrels, it is quite clear from the testimony of the Commission's own engineer that the true amount was 7,000 barrels.

945 13. When the original per well potential method of distribution was initiated in 1933, the allowable for the field was approximately 750,000 barrels per day for far less than 10,000 wells, and, consequently, there was a considerable spread between the wells of low and high potential. Furthermore, the spacing was more uniform. 17,000 wells were drilled since April, 1933.

14. At the high rates of flow allowed during the greater part of 1933, the average reservoir pressure in the field dropped very substantially, clearly showing dissipation of reservoir energy and the great danger of premature and irregular water encroachment. The Commission, by gradual steps, reduced the allowable by the end of 1933 to about 400,000 barrels per day, and, since that time, it has varied between 400,000 and 550,000 barrels per day. The high rates of flow during the greater part of 1933 gave undisputed proof of the wasteful results of too high rates of flow. Since 1933 many wells have been drilled, so that with the allowable being cut from about 800,000 barrels a day in the Spring of 1933 to about 520,000 barrels a day at the present time, which, with Saturday and Sunday shutdowns now in effect, instead of seven days, as then, the average daily allowable is less than 400,000 barrels, the spread between the good wells and properties has become less and less, so that now the distribution is again practically on a per well basis. Indeed, it is almost 99% on a per well basis. Complainant's situation has completely changed from what it was in May, 1933. The high daily allowable in 1933 has dropped to an average now of 14 to 16 barrels a day.

15. For years the Commission has had in effect what is called "Rule 37" for the East Texas field, which has to do with well spacing. For a period the spacing of wells 300 feet apart was allowed, but in the Spring of 1934 the spacing was increased. Since the Spring of 1934, the rule in substance has provided that, 946 with exceptions mentioned hereafter, wells shall not be drilled closer than 330 feet to the property line or closer than 660 feet to another well on the same lease. In effect: the rule contemplates a uniform 10-acre spacing, each well having 10 acres in the form of a square around it. The rule also provides that the

Commission, after notice and hearing, may grant exceptions to the rule in order to prevent waste or to prevent confiscation of property. There is no need to detail the changes which have been made from time to time in Rule 37 prior to the promulgation of the rule now in effect. It is sufficient here to say that a great number of exceptions have been granted, so that most of the wells in the field have been drilled under exceptions to the spacing rule. One exception has called for another, so that the average acreage for each well has steadily decreased, and the number of unnecessary wells has steadily increased. With distribution on a purported per-well-potential basis, now really a flat per-well basis, the incentive to drill more wells is obvious, and the effect of granting exceptions to the 10-acre spacing rule is likewise obvious. It is to make more money, rather than primarily to recover more oil. Except in a few isolated areas, one well will efficiently drain ten acres, and, therefore, the predicament that the Commission finds itself in now is due solely to the relaxation of Rule 37. The Commission, to prevent inequities arising from granting of exceptions, has not attempted adjustment of allowables, nor has the Commission provided for pooling of tracts to prevent confiscation, inequities and unnecessary drilling.

16. At the time of the trial of this cause there were approximately 26,000 wells in the field. There are only a few tracts where the density is one well to 10 acres. The average density for the entire field is now one well

947 to 5.133 acres. There are many densely drilled areas, particularly in the townsites. For instance, in London, there are 154 wells producing on 51.41 acres, or approximately 3 wells to 1 acre; in Glade-water, there are 249 wells producing on 321.43 acres, or approximately 1 well to 1.3 acres; in Kilgore, there are 697 wells producing on 721.33 acres, or approximately 1

well to 1.03 acres. Breaking it down still further, there are instances of 15 wells on 2.59 acres, 10 wells on 3.5 acres, 4 wells on .75 acres, 19 wells on 2.61 acres, 11 wells on 3.04 acres, 16 wells on 16.36 acres, 3 wells on .53 acres, 10 wells on 3.6 acres, 5 wells on .30 acres, 5 wells on .75 acres, 4 wells on .65 acres, 6 wells on 1.5 acres, 5 wells on 1.5 acres, 5 wells on .75 acres, 7 wells on 1.61 acres, 24 wells on 24.35 acres, 26 wells on 19.5 acres. There are many other such instances of closely drilled tracts as the maps in evidence show, many of which are near complainant's tract. In this connection, the exhibits show that The Ambassador Oil Company on the Hamilton Heirs Lease, containing .48 acres, has five wells. At 20 barrels each per day, these wells are producing at the rate of over 200 barrels per acre per day, as compared to complainant's getting only 4.4 barrels per acre per day, or on a yearly basis of 261 days (5 days per week) at the rate of over 52,000 barrels per acre per year recovery, as compared with complainant's 1144 barrels per acre per year. This same company has 15 wells on a 2.59 acre tract, and at 20 barrels per day per well, this tract will produce 300 barrels per day, or at the rate of over 30,000 barrels per acre per year on a 261-day basis. The entire London Townsite, consisting of 51.41 acres, has 154 wells on it. These wells, producing 20 barrels per day, five days per week, or 261 days per year, would yield 803,880 barrels. This is at the rate of 15,636 barrels per acre per year. In other words, these wells have a per acre yield in one year greater than the combined per acre yield on complainant's lease for eight years.

948 Furthermore, a great many of these areas of dense drilling are in portions of the pool where the productive sands are thin, and the reserves per acre are much less than in complainant's lease, which has nearly 100 feet of sand. If some of these densely drilled areas do not directly drain complainant's properties, nevertheless the total allowable given these numerous wells de-

prives complainant of that much of the daily top allowable which it would otherwise share in, and likewise depletes the reservoir of oil that complainant and others similarly situated could recover, if permitted.

17. The Rowan & Nichols lease involved in this suit is a tract of 24.99 acres, known as the Todd "B" lease, being a part of the William H. Castleberry Survey, in Gregg County, situated in the north central portion of the field in the "fairway" where the oil-saturated sand is thick, and where the porosity and permeability are as high as any in the field. Complainant has drilled five wells on the lease which are all flowing. Everything considered, complainant's wells and lease are far above the average. Indeed, they rank at the very top. To the east and to the west of complainant's lease, along a wide front, there is a gradual change in oil-saturated sand thickness to the edges of the field where it becomes zero. On the whole, in a very large area around complainant's lease, the drilling is more dense than on complainant's lease; consequently, the relative allowables per acre, or on basis of reserves, are higher than the allowables granted to complainant's property. Again, though complainant has average drilling density for the field, 1 well to about 5 acres, the property is far superior to average on almost any comparison. R. M. Wood obtained a permit to drill a well on what is contended by the respondents to be one acre, but by complainant to be 1/10th of any acre, immediately adjacent to complainant's lease on the south. There is no evidence to the effect that the Commission required or attempted to require unitization, and after the Wood well was drilled, it was given the same allowable as the best of complainant's wells. It was estimated that the complainant's tract originally had a recoverable reserve of 60,000 barrels per acre. At the present time, it has been estimated to have about 46,000 barrels per acre. At the

present time, the proof shows that there is left in the entire field or reservoir some 2,217,980,000 barrels of recoverable oil. There is estimated to be under complainant's lease at the present time some 1,151,166 barrels. Complainant's allowable is 111.83 barrels per day. Producing 365 days a year, it would take complainant 28.1 years to recover its oil under the present plan. Producing five days a week, as at present, it would take 39.3 years to recover its oil, whereas the rest of the field, producing 365 days a year, would recover all the recoverable oil within 11.35 years. The field, operating on a five-day a week basis, would be completely dissipated at the end of 16.25 years. Taking the ratio that the recoverable oil under complainant's land bears to the recoverable oil under the entire field, its fair share of the daily allowable would be 235 barrels, using Rowan's estimate of the thickness of the sand at 100 feet, or using his engineer's most conservative estimate of 95 feet, it would be 220 barrels a day. Under any reasonable plan of allocation, which the Court cannot prescribe, and using the proper factors, this allowable may vary a little one way or the other. Complainant's lease is situated ideally in the field in what is called the "fair-way", or the best part of the structure, and, under open flow conditions, it would have a very distinct advantage over both the west and east sides. If complainant had been permitted to produce that proportion of the daily allowable that its reserves bear to the reserves of the field, it would have recovered 200,000 barrels, which under the present order it has not been permitted to produce. For some seven years now complainant has been before the Railroad Commission, seeking an adjustment in allowable, and has filed several law suits and has to resort to the Courts to obtain the right to drill two of its five wells. For that matter, with three wells, it already had sufficient wells to produce its fair share of the oil without drill-

ing the two additional wells, which it was forced to drill at a cost of about \$10,000.00 a well, or else not receive the allowable which was assigned to such wells. Should complainant be required to drill more wells to get a higher allowable, it would be required unnecessarily to make such an investment, as it already has enough wells. Indeed, it has more than enough.

Wood took possession of and drilled a well on a tract which complainant claimed was a part of its lease, about the 22nd of August, 1937, at which time complainant had been producing oil from the tract for about six years. After complainant had contested the Wood permit, with other operators, it filed application for adjustment in allowable, and, alternatively, asked for some twenty permits, stating, however, that it sought the permits only in the event it was not entitled to an adjustment in allowable, and that if the latter relief was inconsistent with the former, then to consider it withdrawn. One permit was granted by the Railroad Commission as an offset, but the application for adjustment in allowable was held in abeyance by the Commission for several months, and has not yet been acted upon. In the meantime, this suit was filed. The additional sixth well is not necessary to prevent waste nor to permit complain-

951      ant to recover the oil underneath its tract or its fair share of the oil, and although it would have given complainant a density greater than its neighbors, at the rate permits were being granted the first five months of this year, to-wit, 760, it is reasonable to assume that complainant would have found itself in the same plight again within a short time. The complainant exerted every reasonable effort to obtain an adjustment in allowable, and its situation with reference to drainage was becoming more aggravated monthly, due to the numerous additional wells that were being drilled and being assigned as much as 20 barrels per day regardless of reserves or drilling density.

18. The respondent Commission's monthly proration orders have adopted the same basis for restriction, to-wit, an hourly potential, as determined by the Commission, and by ignoring complainant's applications and protests and by never having passed on its application for an adjustment in allowable, filed February 24, 1938, the Commission has demonstrated that it intends to maintain the present method of distribution, which is approximately 99% well basis and approximately 1% allocated on potential.

19. Studies have been made of the East Texas field sufficient to form what are regarded by petroleum engineers and oil operators as accurate estimates of the oil reserves throughout the field. The same is true of the Rowan & Nichols lease. The factors to be taken into consideration in making such estimates are: (1) acre feet of sand, (2) the porosity and saturation of the sand, (3) the permeability, (4) the pressure, and (5) whether or not there is gas in solution. Numerous cores have been taken throughout the field which reflect much of this information. The average porosity in the field is somewhere between 24 and 26%. There are found streaks of tight, less porous sand, and then streaks of porous sand in the same well, but the average weighted variation

952 runs very nearly 24%. There are not available as many permeability determinations as core determinations, but where there are lacking permeability determinations from cores, it can be readily determined from reservoir pressures, so that the engineers are equally as well fortified as to information with reference to permeability. Surveys have been made whereby it has been very definitely determined where the top and the bottom of the sand are, and sand thickness maps have been made since December, 1932. Pressures are known because the Railroad Commission makes monthly pres-

sure checks, and there is available more pressure information on the East Texas field than nearly any other field in the world. The Bureau of Mines has determined at what pressure the gas in solution will pass out of solution, and it is generally recognized that the violent point is around 575 pounds. All of this information has been made available to the Railroad Commission. There is nothing in the present plan of proration based on potentials that takes into account in any way the difference between the oil reserves under the complainant's 25-acre tract and the oil reserves under the Wood tract or any other tract. There is likewise no factor in the existing proration order, in its application to the East Texas field, that takes into account the respective oil reserves under the various tracts, so as to allow each to produce oil substantially in proportion to the recoverable oil under them, nor is there anything in the order or its application which takes into consideration the relative rights of operators to produce their fair shares of the oil. Neither the order nor its application entitles the owner of leases, or gives the owners of leases in the field, an equal opportunity to realize upon the known recoverable oil reserves of their respective leases. This method of proration results in denying to complainant an opportunity to produce its fair share of the oil, and gives to others 953 an opportunity to produce more than their fair shares of the oil and to drain oil from complainant's lease—oil which complainant would produce if given an opportunity to produce its fair share of the allowable, and twice its part of the daily allowable. In the evaluation of properties in the field, engineers generally use substantially the same formula in determining or ascertaining the recoverable oil reserves under a particular tract of land. One of the witnesses for the respondents has prepared sand maps for several years and has made estimates of recoverable reserves on the basis thereof. The Railroad Commission at one time embraced

in its orders the factor of sand thickness and also bottom hole pressure. The only phase of the present order which relates to the prevention of waste is the top allowable, and, therefore, any reasonable plan of allocation could be resorted to by the Commission just as effectively or more so than the present plan in the prevention of waste, due to the numerous densely drilled areas in the field, which cause low pressure areas, and a per well plan of proration is most likely to continue and aggravate these low pressure areas. The present plan of per well allocation causes unnecessary waste on the west side by reason of the excessive withdrawals of water, and therefore, the dissipation of the reservoir energy. If some of these wells were even closed in, the oil would migrate east and would ultimately be recovered by other operators without the necessity of excessive water withdrawal and the unnecessary dissipation of the lifting energy. Exhibit 8 shows the top of the Woodbine sand, Exhibit 9 shows the water table, and Exhibit 10 shows the thickness of the sand in the field. Schlumberger tests, which are electrical logs taken of wells, indicate the porosity, thus showing shale sections and water. Numerous of these tests have been taken throughout the field,

954 and there was no satisfactory reason shown by the Commission as to why it could not have the advantage of them. The accuracy of these logs is generally conceded. There are numerous plans that could be adopted that would create less waste and that would more reasonably allocate the allowable on the basis of giving each operator an equal opportunity to produce or recover his fair share of the oil or the oil underlying his tract. Even conceding that the potentials as now used by the Commission are accurate, mere acreage could be multiplied by potential and the allowable allocated on a more reasonable basis, which would give complainant at least 50 barrels more per day from its lease than it is now permitted to produce, but still not enough.

20. The relation of complainant's lease to the field in general may be illustrated by the following table submitted by complainant, and substantiated by the evidence in the case:

	East Texas Field.	Complain- ant's Lease	Per Cent of Total
Average Sand Thick- ness .....	42	95	.....
Acre Feet .....	5,586,000	2,374	.04219
Density .....	5.1333	5.00	.....
Well Production to 1 1 39 <sup>0</sup> .....	1,304,730,000	355,254	.027228
Total Potential .....	15,667,543	4,820	.03076
Average Potential .....	605	964	.....
Present Allowable .....	522,591	112	.02143

It is not disputed that the average oil saturated sand thickness in complainant's lease is over 95 feet. Hundreds of leases, covering thousands of acres, have 30 feet or less. The average for the field is 42 feet. Therefore, complainant's lease has some 50 feet above the average. The significance of these figures becomes apparent when it is realized that, as is well known, many prolific fields do not have as much as 50 feet of sand. The orders of the Commission do not take into account the advantage which complainant has over others in having the maximum of oil saturated sand.

955 21. The difference between almost the poorest wells in the field that will only produce 20 barrels daily and wells like complainant's, which rank with the best in the field, is only 5 barrels. The production allocated to the wells is as follows:

21,179 wells produce about 20 barrels, or a total of 423,580 barrels.

2,000 wells produce about 21 barrels, or a total of 42,000 barrels.

1,831 wells produce about 22 barrels, or a total of 40,282 barrels.

319 wells produce about 23 barrels, or a total of 7,337 barrels.

96 wells produce about 24 barrels, or a total of 2,304 barrels.

22 wells produce about 25 barrels, or a total of 550 barrels.

Complainant's wells are allowed to produce daily, as follows:

Well No.	No. of Barrels
1 .....	22,388
2 .....	22,272
3 .....	22,388
4 .....	22,504
5 .....	22,272

22. The practical effect of the order and the restriction which is imposed, is to allow complainant to produce from its lease at a rate slightly in excess of 4 barrels per acre per day, while, for instance, Wood, on the adjoining tract, is allowed to produce 220 barrels per acre per day, if he owns 1 10th of an acre, or 22 barrels per acre per day if he owns 1 acre. This condition is true in numerous places in the field.

23. While the State, or rather the Commission, undertakes to justify the use of mere potential, regardless of other factors, such as size or richness of tract, on the

ground that the limit of error is not so great, if mere potential be used, and on the ground that potential indicates most of the factors anyhow, such line of reasoning defeats itself. In effect, the Commission contends that, if there are two adjoining tracts, one of 10 acres with one well, and another of  $1/10$ th of an acre with one well, both with identical potentials (real or calculated), the  $1/10$ th of an acre tract has the same recoverable reserve, and should have the same allowable as the well on the 10-acre tract. Surely it is more reasonable to assume that there is 100 times more recoverable oil in the 10-acre tract than in the  $1/10$ th of an acre tract, and that the size of the tracts should be taken into account. For all practical purposes it is a fact that each acre of the 10-acre tract has 10 times as much recoverable oil as the adjoining  $1/10$ th of an acre tract. The Commission, by its orders and its method of restriction, ignores that fact, by giving the 10-acre tract and the  $1/10$ th of an acre tract the same allowable. As long as such a method of distribution is followed, the owners of large tracts will not recover their fair shares, and will be prevented from recovering their fair shares by the owners of small tracts who are recovering more than their fair shares. The effect of the program thus is to take the oil of one operator and give it to another, even where the potentials are the same. The giving of the same allowable to a good well on a large tract as to a small well on a small tract, increases the inequity.

24. It might be conceded that the potential of a well may give some slight indication of pressure, sand thickness, porosity, permeability, reserves in the area, and even position on structure which has some bearing on recoverable reserves. Witnesses for respondents do not, however, say very definitely how accurate is the information given with respect to each of the factors mentioned. Obviously, if a well produces only a trickle of oil, thereby

having an insignificant potential, while a well on another lease has a high potential, it is evident that the area around the first well does not have the same recoverable reserves as the area around the second well.

957 Beyond doubt, under the assumed facts, there would be indicated a variation or difference in one or more of the following factors which have to do with recoverable reserves: pressure, sand thickness, porosity, permeability, and recoverable reserve around the well. On the other hand, the potential standing alone does not appraise each of these factors separately. For instance, in the first well the lack of potential may be caused wholly by a very thin sand, though pressure, porosity and permeability be very high, or it may have been caused by very low pressure, or simply by very little porosity, or by the method of well completion.

25. To some degree it is true that wells along the extreme east edge of the field and along the west edge of the field will become exhausted before complainant's wells which are favorably situated in the fairway; but, even if this should take place, so that the allowables for wells in the fairway would be increased, it does not follow that complainant would recover its fair share. In the first place, the top of the sand in complainant's lease is lower by some 30 feet than in leases to the east of it; consequently, water will drown out complainant's wells before it drowns out wells further up structure. While it is true that wells on the extreme edge of the field will likely be abandoned before complainant's wells become non-productive, most of the abandonments along the east side of the field will simply be on the edges, and the number will not be considerable. It is rank speculation to say that to the east of complainant's tract wells having 20 feet or more of sand will be abandoned before water drowns out complainant's wells. It does not at all follow, as implied by the State, that the aban-

donment of wells along the east and west edges will naturally increase the allowable for the remaining wells in the field, including complainant's.

In 1938 the abandonments totaled 207, but new permits totaled 1,771. It is unwarranted speculation to assume that the present allowable for the field will be continued when the field becomes much smaller as the result of water encroachment. In view of pressure declines, gas coming out of solution, and water production becoming greater, the probabilities are that in the later stages of the producing life of the field it will not be permitted to produce as much as 500,000 barrels of oil per day, so there is no assurance whatever that the allowables for complainant's wells will be increased in the years to come by the application of the present proration formula. Indeed, if we are to speculate, it should be to assume that, absent some compulsion exerted on the Commission, the per-well allowable will be continued, and complainant will in the future be substantially in the same comparative position as it is at the present time, having much less than its fair share. Furthermore, areas to the east of complainant's wells are more densely drilled than is complainant's lease. If complainant is entitled to its fair share of the oil, it is also entitled to its fair share of the energy; and therefore, it should be permitted to produce its fair share of the oil by flowing, rather than waiting until the energy is dissipated and being required to pump its oil, which is a much more expensive process.

26. It appears that a line drawn north and south approximately through the center of the field is a line dividing properties into two classes. Under the present method of distribution, properties west of this line will recover less than the amount of recoverable oil which was originally underneath such properties, while properties to the east of the line will recover more than was orig-

inally under the properties. Complainant's lease is a short distance west of the maximum recovery line; consequently, under the present plan of proration, it will not even be permitted to recover a total amount equivalent to the original reserves which were under the tract, much less any additional amount which would be recoverable by virtue of structural position. It follows, of course, that it is not given the advantage of its structural position with respect to properties to the west of it. The present plan of proration, being really on a per-well basis, has the effect of taking oil from complainant and giving it to owners of wells and properties less favorably situated and having far less recoverable oil in their lands. Many operators situated similarly to complainant, and many less favorably situated in all respects, are given advantages when reserves or potential are considered, also position on structure, even if time be taken into account. It is clear, therefore, that, under the present plan or one similar to it, the time element will not give an opportunity to complainant to recover its fair share of the recoverable oil in the field. Furthermore, there appears to be no necessity to permit many operators to recover in a reasonably short time their shares of the recoverable oil, while complainant must continue to suffer loss an indefinite but great number of years in order to enjoy its property which is one of the best in the field. Even under the most favorable assumptions, an unreasonable time will have passed before there will be even a probable opportunity for complainant to recover even a substantial part of its fair share of the reserves of the field.

27. Several methods of distribution have been suggested which, if adopted, would minimize the inequities and reasonably avoidable drainage resulting from the present method of distribution. One witness suggested a method based on acre feet of sand thickness, with a

correction factor for bottom hole pressure. The same factors formerly used by the Commission, but  
 960 giving each the proper percentage, would not only be fairer, but would be more conducive to the prevention of waste, and in adopting such plan, the witness suggested that a minimum should be given to tracts, rather than wells, in view of the large number of unnecessary wells drilled. It was not shown that any effort was made to unitize these numerous small tracts, which would be in aid of any plan. Numerous plans are well known to the Commission and its engineers; they are workable and easy of administration. Beyond question, many factors may properly be considered other than real potentials, or in connection with real potentials, such as sand thickness, surface area, recoverable reserves, pressures, and location on structure. Practically every engineer and geologist familiar with the East Texas field, as well as the Railroad Commission, by estimating the recoverable reserves in the East Texas field, must have determined the acre feet of saturated sand in the reservoir; otherwise, no such accurate estimate could have been made. Any formula which gives consideration to the recoverable oil or reserves under any lease should properly take into consideration acre feet of saturated sand or its equivalent. It is obvious that a proper method of distribution must take into account the size of the tract upon which each well is situated, or stated differently, must take into account drilling densities. Various methods of distribution can be devised which will be fair to all, and will give to complainant an opportunity to produce its fair share of the oil without being required to drill unnecessary wells to obtain such share.

28. There are a number of pumping wells in the field which have for some time been producing relatively small amounts of oil, but some of them producing more than is necessary to prevent their premature abandonment.

There are 451 wells which are unable to make as much as 20 barrels per day. These are assumed by 961 the complainant and the Commission to be marginal wells, as defined by law (Article 6049b, Vernon's Texas Civil Statutes). The other pumping wells in the field are capable of producing more than 20 barrels per day for more than 30 consecutive days, and no loss of production ultimately recoverable, and no damage to the wells, and no premature abandonment of wells would occur if such wells were artificially restricted below 20 barrels per day. The 451 wells average about 11 barrels a day or a total of approximately 5500 barrels a day, or  $1\frac{1}{4}\%$  of the total daily allowable, and only about  $\frac{1}{4}$ th of what any one of Rowan & Nichols Oil Company's wells could produce in one day. A considerable number of wells in the field are being pumped profitably at the rate of about 5 barrels per day, and the Commission's schedule shows that some wells are operating at substantially less than 5 barrels a day. The production from the 451 wells represents a small factor in the ultimate recovery of this vast field.

From the standpoint of waste, none would occur if many wells in the field were actually shut in, or were allowed to produce as little as 5 barrels per day, though it might be advisable, in order to void paraffin trouble, to produce such wells' average allowable every other day, or once in three or four days, rather than on each day. Furthermore, it is not at all conclusive that any substantial reserves lying around these wells will be ultimately lost even if they should be plugged. Their reserves would be produced by other wells. Moreover, it is indicated that the production of many of these wells, with the large amount of water that is brought up with the oil, is even more harmful and wasteful to the field than the abandonment of those wells themselves would be. The oil that most of them would fail to recover by

being abandoned would be recovered by other  
962 wells. The cost of pumping equipment in the  
field is approximately \$3,500.00 per well. The  
price of oil in the East Texas field for about five months  
prior to the trial of this case has been \$1.10 per barrel.  
For a long time previous, it was \$1.35 per barrel. Some  
4,122 wells have been drilled since January 1, 1937,  
although the field at that time had an average density  
of more than 1 well to 10 acres and although the effect  
of Rule 37 is a finding that one well to 10 acres is a  
proper spacing regulation in prevention of waste to re-  
cover the recoverable oil under said field. It is clear  
that a reasonable profit above normal operating expenses  
can be made from a well in the East Texas field pro-  
ducing 5 barrels per day. Obviously, the expense of pro-  
duction from a flowing well is not as great as that of pro-  
ducing a pumping well.

29. The parties hereto admit that for the purpose of  
waste prevention the top allowable for the field should  
not materially exceed approximately 500,000 barrels a  
day. If that allowable be distributed on a reasonable  
basis, then the better wells and properties will, on the  
average, receive far more than 20 barrels each, and the  
poorer wells and properties, on the average, will receive  
substantially less than 20 barrels each. It would be more  
accurate to say that operators with larger recoverable  
reserves would have relatively higher allowables than  
operators with much smaller recoverable reserves. By  
such a fair and reasonable method of distribution, the  
Commission would prevent waste by limiting the field  
to approximately 500,000 barrels per day and would also  
avoid the taking of the property of one operator for the  
benefit of another. There is nothing in the marginal well  
statute or any other statute which prohibits such a pro-  
gram.

30. Generally speaking, waste is prevented in the East Texas field by maintaining a relatively low top allowable and distributing that allowable in such a way that there will not be heavy or concentrated production in localized areas which would tend to cause relatively low pressure areas and to pull in water abnormally. Any of the methods of distribution of such a top allowable which gives to complainant and others the opportunity to receive their fair shares of the allowable would not create as much waste as does the present method of distribution, but, on the contrary, some of the other methods suggested would have a tendency to reduce waste now existing, for, under a per well method of distribution, low pressure areas and premature and damaging water encroachment are likely to occur, where wells are dense, as at Gladewater, London, Kilgore, and elsewhere.

31. The original order, passed in 1933, based on potentials actually taken at the time, allocated the production on the basis of 15% of the hourly potential. There were some 8,000 wells at that time. In the meantime, the wells have practically trebled, and the allowable percentage has been decreased to 2.32%, though, as stated, few wells are actually restricted to 2.32% of their true, or even comparative potentials. The field allowable has likewise been substantially decreased, to-wit, more than 50%, from approximately 750,000 to 375,000 average per day. The continued drilling has therefore operated to make this system of proration progressively more oppressive until the field is again on a per well basis. The potential factors of the order have practically become nil. Complainant has constantly protested to the Commission with regard to the order, without result. It appeared in the Courts, protesting same, and subsequent to the decision in Brown vs. Humble, complainant again protested to the Commission. Although its last application for an adjust-

ment in allowable was filed February 24, 1938, it has not yet been finally refused or granted by the Commission, at least by any specific ruling, except that the Commission, by its monthly orders and allowables, has continued to fix the same comparative allowables, making no adjustment. This suit was filed in September, 1938. Furthermore, complainant has attempted to relieve itself by applying alternatively for permits to drill additional wells, however unnecessary they might be in the production of its property, without relief.

### CONCLUSIONS OF LAW.

1. The orders of the Commission, as they are interpreted, applied and enforced as to complainant, do not allocate or distribute the allowable "on a reasonable basis," as required by the statute, and operate to confiscate complainant's property contrary to the due process and equal protection clauses of the Fourteenth Amendment to the Constitution of the United States, and are void as so interpreted, applied and enforced.

2. The method of distribution under the orders attacked by complainant, as applied and enforced as to complainant, denies to complainant the opportunity to recover ultimately, much less within a reasonable time, an amount of oil in the proportion that the recoverable reserves which were originally under its lease bear to the recoverable reserves in the field.

3. The method of distribution adopted by the Commission, as applied and enforced as to complainant, does not give complainant the opportunity to produce ultimately, much less within a reasonable time, an amount of oil which would be recovered if, at the time of each proration order, the allowable should be fixed for complain-

ant's property substantially in the proportion that the recoverable oil in its lease at that time bore to the recoverable oil in the field.

4. The method of distribution adopted by the Commission does not, as it is enforced and applied to complainant, give to complainant an opportunity to recover the oil underlying its tract of land.

965 5. Complainant cannot be required to resort to the confiscatory method of drilling additional and unnecessary wells to recover its fair share of the recoverable oil in said field or to recover the oil underneath its tract.

6. The application and enforcement of said orders and method of restriction under attack by complainant are void as to complainant in that the denial to complainant of the equal opportunity to produce presently, and not at some time in the distant future, its fair share of the oil in said field, is confiscatory and therefore void.

7. The applicable part of the marginal well statute reads as follows:

"Art. 6049 b: Marginal wells defined; curtailing production.

"Sec. 1. The term 'Marginal Well' as used herein means a pumping oil well capable, under normal unrestricted operating conditions, of producing such daily quantities of oil as herein set out as would be damaged, or result in a loss of production ultimately recoverable, or cause the premature abandonment of same, if its daily production were artificially curtailed. The following described wells shall be deemed 'Marginal Wells' in this State:

"(b) Any pumping oil well within this State having a daily capacity for production of twenty (20) barrels or less, averaged over the preceding thirty (30) consecutive days, producing from a horizon deeper than two thousand (2,000) feet and less in depth than four thousand (4,000) feet." \* \* \*

There is nothing in the marginal well statute or any other statute which forbids the Commission from restricting non-marginal wells below the limit applicable to true marginal wells as defined by statute. Reducing the allowable of wells to 5 barrels a day will not cause abandonment of the wells, loss of production ultimately recoverable, or damage any property or well. If the statute be interpreted to mean, as the Commission seems to think,

966 that the Commission cannot restrict non-marginal wells in the field below 20 barrels, then as long as the top allowable is not more than about 525,000 barrels a day, virtually all of the wells, good and bad, are given substantially the same allowable, resulting in unnecessary confiscation of complainant's property, and either the statute or the program of restriction to about 525,000 a day must fall. The parties admit that for the purpose of waste prevention the top allowable for the field should not materially exceed approximately 500,000 barrels a day. If that allowable, less the small amount produced by the true marginal wells, be distributed on a fair basis as outlined herein, then the better wells will on the average receive substantially more than 20 barrels each, and the poorer wells, on the average, will receive substantially less than 20 barrels each. It would be more accurate to say that operators with larger recoverable reserves would have relatively substantially higher allowables than operators with smaller recoverable reserves. By such a fair method of distribution, the Commission would perform its statutory duty of preventing waste by limiting the field to approximately 500,000 barrels per day

and would also avoid the taking of the property of one operator for the benefit of another. There is nothing in the marginal well statute or any other statute which prohibits such a program, so the Commission has acted arbitrarily and without justification in refusing to distribute the allowable in a manner to give complainant the opportunity to produce its fair share.

It is apparent that the effect of the so-called "statutory marginal wells," producing only about 5,500 barrels a day, is very slight as far as the general scheme of proration for the East Texas field is concerned. In any event, the marginal well statute offers no excuse for a flat 20 barrels allowance to other wells whose potentials run from practically zero to 860 barrels an hour.

Done at Austin, Texas, this 7th day of August, 1939.

ROBERT J. McMILLAN, Judge.

967 Findings of Fact and Conclusions of Law. Filed August 7, 1939.

968

## STIPULATION.

(Title Omitted.)

It is stipulated that upon the trial of the above entitled and numbered suit evidence was offered to establish, among others, the following facts:

1. The total daily allowable for the East Texas Field as fixed by the Railroad Commission order in force at the time of trial was about 522,500-barrels of oil.

2. The order promulgated by the Railroad Commission and in force at the time of trial for the proration of this field allowable among the wells in the field provided: "the owner or operator or manager of each well in the East Texas Field shall be permitted, either collectively or individually, to produce daily from each well a maximum of two and thirty two hundredths (2.32) per cent of its hourly potential capacity as determined by the Commission."

3. In the application and enforcement of the above proration order (a) each well that could not produce as much as 20-barrels of oil per day was allowed to produce the maximum amount that it could produce; (b) where 2.32% of the hourly potential of any well would amount to less than 20-barrels per day, the well was allowed to produce 20-barrels of oil per day; (c) where 2.32% of the hourly potential of any well would amount to more than 20-barrels of oil per day, such well was allowed to produce 2.32% of its hourly potential.

969. This application of the order resulted in the following: Approximately 451-wells, not any one of which was capable of producing as much as 20-barrels per day, were allowed to produce daily a total of approximately 5,250-barrels. Approximately 19,032-wells whose individual hourly potential when multiplied by 2.32% amounted to less than 20-barrels, were each allowed to produce a full 20-barrels per day; or from all of such wells a total of approximately 380,640-barrels per day. These were wells whose hourly potential ranged anywhere from 1-barrel to 860-barrels per hour. Approximately 6,325-wells whose individual potential when multiplied by 2.32% amounted to more than 20-barrels were each allowed to produce daily that number of barrels which equaled the product of its hourly potential multiplied by 2.32%. The total daily production from these

wells was approximately 136,610-barrels. These wells had an hourly potential ranging from 865-barrels per hour to about 1,100-barrels per hour. In practical operation, the daily allowable of no well was controlled by the factor 2.32% of its hourly potential unless such well had a potential of 865-barrels or more per hour.

The plaintiff offered testimony to show that if each well in the field that could not make 20-barrels per day was allowed to produce the maximum which it was capable of producing, and if every well in the field that was capable of making 20-barrels per day was allowed to produce 20-barrels per day, that the aggregate of such production amounted to some 510,000 or 515,000-barrels of the daily allowable of approximately 522,500-barrels, with the result that only about 7,000 to 12,000-barrels of the total daily production was in the practical application of the order of the Commission prorated on the factor of 2.32% of the hourly potential of the wells.

4. The testimony shows that the wells were shutdown on Saturdays and Sundays and were allowed to produce only five (5) days each week and the figures 970 referred to in the testimony were for the days on which the wells were allowed to produce.

Witness Our Hands this the 16th day of May, 1939.

RICE M. TILLEY,

DAN MOODY,

Attorneys for Plaintiff,

JAMES P. HART,

D. D. MAHON,

Attorneys for Defendants.

Stipulation. Filed 17th day of May, 1939.

## 971 REQUEST FOR PARTIAL RECORD.

(Title Omitted.)

To the Clerk of said Court:

The Railroad Commission of Texas and Lon A. Smith, Ernest O. Thompson and Jerry Sadler, the Members of the Railroad Commission of Texas, and Gerald C. Mann, Attorney General of Texas, respondents in the above entitled and numbered cause, being desirous to docket the appeal in this cause in order to make in the United States Circuit Court of Appeals for the Fifth Circuit a motion for a stay pending appeal, request the Clerk of this Court to certify and transmit to the United States Circuit Court of Appeals for the Fifth Circuit a copy of a portion of the record and proceedings in this cause needed for such purpose, to-wit:

1. Complainant's original bill of complaint.
2. Amendment to complainant's bill of complaint.
3. Respondents' amended answer.
4. Opinion of the Court dated June 12, 1939.
5. Final judgment of the Court entered on June 14, 1939.
6. Respondents' motion for stay pending appeal.
7. Order of the Court dated June 14, 1939, denying stay pending appeal.

972 8. Notice of appeal of respondents.

9. Respondents' appeal bond.

GERALD C. MANN,  
Attorney General of Texas,  
JAMES P. HART,  
Assistant Attorney General,  
D. D. MAHON,  
Assistant Attorney General,  
HARRY S. POLLARD  
Attorneys for Respondents.

Address: State Capitol,  
Austin, Texas.

#### Proof of Service.

Service of the foregoing request was made by delivering a copy thereof to Susette Meyer, at the office of Dan Moody, one of the attorneys for complainant, in the Norwood Building, Austin, Texas, at 4:04 o'clock P. M., on the 19th day of June, 1939.

JAMES P. HART,  
Attorney for Respondents.

Filed 19th day of June, 1939.

973

#### MOTION FOR JUDGMENT.

(Title Omitted.)

To the Honorable Judge of said Court:

Come now the defendants in the above entitled and numbered cause, after the plaintiff has rested its case,

and moves the Court to enter judgment in favor of defendants.

GERALD C. MANN,  
Attorney General of Texas,  
JAMES P. HART,  
Assistant Attorney General,

State Capitol, Austin, Texas.

D. D. MAHON,  
Assistant Attorney General,  
HARRY S. POLLARD  
Attorneys for Defendants.

Filed 8th day of February, 1939.

974

# STIPULATION AS TO RECORD.

(Title Omitted.)

## I.

Pursuant to the provisions of Rule 75(f) it is stipulated by the parties to this action that the following parts of the record, proceedings and evidence shall be included in the record on appeal:

(1) The parts of the record heretofore certified by the clerk of this Court in a partial transcript of record certified on the 20th day of June, 1939, to-wit:

- (a) Complainant's Original Bill of Complaint.
- (b) Amendment to Complainant's Bill of Complaint.

- (c) Respondents' Amended Answer.
- (d) Opinion of the Court dated June 12, 1939.
- (e) Final Judgment of the Court entered on June 14, 1939.
- (f) Respondents' Motion for Stay pending Appeal.
- (g) Order of the Court dated June 14, 1939, denying Stay pending Appeal.
- (h) Notice of Appeal of Respondents.
- (i) Respondents' Appeal Bond.
- (2) The stenographic statement of the evidence in question and answer form, certified by John Waide, Court Reporter, on August 1, 1939.
- 975 (3) Findings and conclusions of the Court.
- (4) Stipulation of the parties, filed May 17, 1939.
- (5) Appellants' request for partial record, filed June 19, 1939.
- (6) Motion of respondents for judgment, filed February 8, 1939.
- (7) Stipulation of the parties as to the record.
- (8) Order of the Court directing the transmittal of original papers and exhibits to the Circuit Court of Appeals for the Fifth Circuit.

(9) Order of the Court dated June 28, 1939, extending the time for filing the record on appeal and docketing the action.

## II.

It is further stipulated by the parties that the following papers and exhibits may be transmitted to the Circuit Court of Appeals for the Fifth Circuit for inspection:

Exhibits 7, 8, 9, 10, 11, 12, 19, 20 and 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 38, 39 and 40.

Witness our hands at Austin, Texas, this 8th day of August, 1939.

DAN MOODY,

Attorney for Complainant,

JAMES P. HART,

Attorney for Respondents.

Filed 9th day of August, 1939.

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### ORDER OF COURT DIRECTING CLERK TO TRANSMIT CERTAIN ORIGINAL EXHIBITS TO CIRCUIT COURT OF APPEALS.

976

(Title Omitted.)

It appearing to the Court that the parties to this action have stipulated that the original papers and exhibits hereinafter named should be transmitted to the United States Circuit Court of Appeals for the Fifth Circuit, and it further appearing to the Court that such original papers and exhibits should be inspected by said Appellate Court

and should be sent to said Appellate Court in lieu of copies,

It is Ordered that the Clerk of this Court shall transmit to the United States Circuit Court of Appeals for the Fifth Circuit the following original papers and exhibits introduced upon the trial of this action, to-wit:

Exhibits 7, 8, 9, 10, 11, 12, 19, 20, and 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 38, 39 and 40.

Done at San Antonio, Texas, this 10th day of August, 1939.

ROBERT J. McMILLAN,  
District Judge.

Filed 11th day of August, 1939.

### ORDER EXTENDING TIME FOR FILING RECORD ON APPEAL.

977 (Title Omitted.)

Respondents having requested the Court to extend the time for filing the record on appeal and docketing this action in the United States Circuit Court of Appeals for the Fifth Circuit, and it appearing to the Court that notice of Appeal dated June 19, 1939, has been filed by respondents, and that September 16, 1939, is less than ninety days from the date of the notice of appeal,

It is Ordered that the time for filing the record on appeal and for docketing this action in the United States Circuit Court of Appeals for the Fifth Circuit is extended until September 16, 1939.

Entered at San Antonio, Texas, this 28th day of June, 1939.

ROBERT J. McMILLAN,  
United States District Judge.

Filed June 28, 1939.

978

## CLERK'S CERTIFICATE.

The United States of America,  
Western District of Texas. ss.

I, MAXEY HART, Clerk of the United States District Court in and for the Western District of Texas, do hereby certify that the foregoing on 977 pages, contained in five (5) volumes, numbered one (1) to five (5), respectively, (every volume being identified by my official signature on the last page thereof), is a true and correct transcript of the final portion of the proceedings had and orders entered, as therein stated, in Cause No. 624 In Equity, styled Rowan & Nichols Oil Company versus Railroad Commission of Texas, et al., as the same appear on file and of record in this office.

I further certify that the transcript embraces only such pleadings, process and orders as are specified in the Stipulation as to Record filed herein.

Witness my official signature and the seal of said District Court, at office in the City of Austin, Texas, this the 25th day of August, A. D. 1939.

MAXEY HART,

(Seal)

Clerk of said Court.

By J. F. CAROLINE, Deputy.

[fol. 1005] That thereafter the following proceedings were had in said cause in the United States Circuit Court of Appeals for the Fifth Circuit, viz.:

ARGUMENT AND SUBMISSION

Extract from the Minutes of October 2nd, 1939

No. 9173

RAILROAD COMMISSION OF TEXAS, ET AL.

VERSUS

ROWAN & NICHOLS OIL COMPANY

On this day this cause was called, and, after argument by James P. Hart, Esq., Assistant Attorney General of Texas, for appellants, and Dan Moody, Esq., for appellee, was submitted to the Court.

[fol. 1006] OPINION OF THE COURT—Filed November 3, 1939

IN THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE FIFTH CIRCUIT

No. 9173

RAILROAD COMMISSION OF TEXAS, ET AL., Appellants,

VERSUS

ROWAN & NICHOLS OIL COMPANY, Appellee

Appeal from the District Court of the United States for the Western District of Texas

(November 3, 1939)

Before Foster, Sibley and Holmes, Circuit Judges

FOSTER, Circuit Judge:

This suit was brought by Rowan and Nichols Oil Co., owner of an oil lease in the East Texas Field, hereafter referred to as plaintiff, to enjoin the Railroad Commission of Texas, hereafter referred to as the Commission, its members

and the Attorney General of Texas, from enforcing against plaintiff an order issued by the Commission, on August 29, 1938, and subsequent amendments, fixing the amount of crude oil permitted to be produced daily from the East Texas Oil Field, usually referred to as the "allowable", and prorating production as to the wells in the field. The [fol. 1007] orders fixed the total allowable at about 522,500 barrels a day and restricted each well to daily production of 2.32 per cent of its hourly potential production. Plaintiff did not challenge the authority of the Commission to enter the order nor attack the top daily allowable. The bill alleged the order as interpreted and enforced by the Commission was unreasonable, arbitrary and confiscatory of plaintiff's property, without due process of law, in violation of the 14th Amendment. The bill prayed for an interlocutory injunction. By amendment this was waived and the case was tried before the District Judge, sitting alone. There was judgment for plaintiff. 28 F. Supp. 131. This appeal followed.

The District Court made extensive and comprehensive findings of facts, which were not excepted to. It is unnecessary to review them all. The case may be substantially stated as follows.

The East Texas Oil Field is approximately 40 miles in length from north to south with an average width of 4 miles from east to west. It lies in Upshur, Gregg, Smith and Rusk Counties, and it is of about 133,000 acres in surface extent. It has produced oil continuously since its discovery in October, 1930. The oil is in a continuous, common reservoir about 3600 feet below the surface, contained in what is called the Woodbine sand.

The average depth of the Woodbine sand throughout the field is 42 feet. On a line drawn through the centre of the field from north to south, which is called the fairway, the average depth of the Woodbine sand is about 100 feet. Plaintiff is the owner of an oil lease, known as the Todd B. Lease, covering 24.98 acres in Gregg County. It is located in the fairway. The average depth of oil bearing sand under the lease is 95 feet. It was estimated that at the time of suit the entire recoverable oil in the field was 2,217,980,000 barrels [fol. 1008] and the recoverable oil under plaintiff's lease was 1,151,168 barrels.

Plaintiff has five wells on its lease with a potential capacity of about 20,000 barrels per well per day. Under the order complained of each of its wells is allowed to produce

a little over 22 barrels of oil a day, a total of 112 barrels. Orders of the Commission require all wells to be shut down on Saturdays and Sundays leaving five productive days a week.

Plaintiff made application to the Railroad Commission for permission to drill a number of additional wells on its lease but was granted permission to drill only one. It costs about \$10,000 to drill a well in the East Texas Field. The well has not been drilled. As to the enforcement of the order the parties have stipulated as follows:

"In the application and enforcement of the above production order (a) each well that could not produce as much as 20-barrels of oil per day was allowed to produce the maximum amount that it could produce; (b) where 2.32% of the hourly potential of any well would amount to less than 20-barrels per day, the well was allowed to produce 20-barrels of oil per day; (c) where 2.32% of the hourly potential of any well would amount to more than 20-barrels of oil per day, such well was allowed to produce 2.32% of its hourly potential.

"This application of the order resulted in the following: Approximately 451-wells, not any one of which was capable of producing as much as 20-barrels per day, were allowed to produce daily a total of approximately 5,250-barrels. Approximately 19,032-wells whose individual hourly potential when multiplied by ~~2.32%~~ amounted to less than 20-barrels, were each allowed to produce a full 20-barrels per [vol. 1009] day; or from all of such wells a total of approximately 380,640-barrels per day. These were wells whose hourly potential ranged anywhere from 1-barrel to 860-barrels per hour. Approximately 6,325-wells whose individual potential when multiplied by 2.32% amounted to more than 20-barrels were each allowed to produce daily that number of barrels which equaled the product of its hourly potential multiplied by 2.32%. The total daily production from these wells was approximately 136,610-barrels. These wells had an hourly potential ranging from 865-barrels per hour to about 1,100-barrels per hour. In practical operation, the daily allowable of no well was controlled by the factor 2.32% of its hourly potential unless such well had a potential of 865-barrels or more per hour.

The 451 wells referred to in the stipulation as allowed to produce all they can may properly be classed as marginal

wells under the terms of a Texas statute. (Art. 6049-b, Vernon's Civ. Stat.) which, inter alia, defines a marginal well as any pumping well having a daily output of production of 20 barrels or less. The statute prohibits the Railroad Commission from restricting the production of any marginal well as thereunder defined.

Plaintiff concedes that restriction of production and proration is necessary to prevent waste in the East Texas Field. It makes no point as to the 451 marginal wells. Its principal contention is that allowing all other wells with a potential capacity of not over 20 barrels a day to produce all they can is arbitrary, unjustly discriminatory and confiscatory of its property as any other wells in the field drain the oil from under its lease to some extent. By way of comparison it is pointed out, and the facts were so found by the District [fol. 1010] Court, that nearby leases are more closely drilled. One of .48 acres has five wells which produce at the rate of over 200 barrels per acre per day. Another lease has 15 wells on 2.59 acres, which are allowed to produce 300 barrels per day.

The District Court reached the conclusion that the Commission should have considered as essential factors in allocating the daily allowable the depth of sand under each acre and the estimated amount of oil in place. Judgment was entered enjoining the Commission from enforcing the order and from interfering with plaintiff in the daily production of its fair share of the daily allowable fixed by the Commission, which fair share was fixed at the ratio which 220 barrels bear to 522,000 barrels, basing this upon the recoverable oil under plaintiff's lease and the total amount of recoverable oil in the field. This would allow plaintiff to produce approximately 44 barrels of oil per day from each of its wells, about twice as much as under the order as enforced by the Commission.

Under the law of Texas the owner of an oil lease is the owner of the oil in place under the lease. The Commission had authority to regulate the development of the land and production of the oil but must allow the lease owner to produce a fair share of his oil. The findings of facts by the Commission are not conclusive. Its orders must be reasonable and not arbitrary to be valid and any person challenging their legality may resort to the courts for relief. *Brown vs. Humble Oil Co.*, 126 Texas 296; *Gulf Land Co. vs. Atlantic Ref. Co.*, 131 S. W. (2d) 73. Necessarily, when

rights guaranteed by the Federal Constitution are infringed Federal Courts have jurisdiction. *St. Joseph Stock Yards Co. vs. U. S.*, 298 U. S. 38.

Conceding that, as contended by the Commission, the burden to show illegality of the order rested upon plaintiff, we think that burden has been sustained. Under the undisputed [fol. 1011] facts as shown by the record it is plain that the daily allowable of 522,000 barrels, wells operating on a five days basis, would exhaust the entire field in 16 to 17 years, while plaintiff would be permitted to produce only approximately one-half of the oil it owns, in place under its lease, in the same period, losing the other half entirely from drainage by other wells.

There is undisputed evidence tending to show that a pumping well in the field averaging five barrels production a day can be operated with some profit, although the cost of installing pumping apparatus would be about \$3500 a well. It follows that a flowing well producing the same quantity of oil could be operated at a larger profit. Flowing wells producing 20 barrels of oil a day or less could not be considered as marginal wells coming within the mandatory terms of the statute. The Commission is without authority to so class them. It would seem that a more equitable order could be drafted by fixing a lower maximum production for the smaller wells and raising the percentage of potential production allowed. But that is a question to be decided by the Commission as to which the express no opinion.

The Commission contends that fixing the ratio of production for plaintiff was not within the province of the court. Generally, courts passing upon administrative orders are not authorized to substitute their judgment for that of the authority issuing the order and must content themselves with enjoining the operation of the order as made. However, there are exceptional cases in which equity and justice require a court to temporarily do so. *Newton vs. Consolidated Gas Co.*, 258 U. S. 165. In this case the Commission has no just ground of complaint. The judgment in effect restricts plaintiff to the production of 44 barrels of oil per day per well instead of 22 barrels allowed by the order. If [fol. 1012] that were not so plaintiff would be at liberty, with the order enjoined, to produce its full capacity, which would be unfair to other wells in the field still restricted.

We agree with the District Court that in entering an order prorating the amount of oil allowed to be produced from

each well, the Commission should take into consideration the amount of oil in place under the lease as well as other relevant factors and should so administer the order as to allow each lease owner to produce his fair share of the oil from the common reservoir. In order to remove any doubt as to the temporary character of the ratio fixed by the District Court, the judgment will be amended to read "without prejudice to the right of the Commission to enter a reasonable proration order and to fairly enforce it."

As so amended the judgment is  
Affirmed.

[fol. 1013]

# JUDGMENT

Extract from the Minutes of November 3rd, 1939

No. 9173

RAILROAD COMMISSION OF TEXAS, ET AL.,

VERSUS

ROWAN & NICHOLS OIL COMPANY

This cause came on to be heard on the transcript of the record from the District Court of the United States for the Western District of Texas, and was argued by counsel;

On consideration whereof, It is now here ordered, adjudged and decreed by this Court, that the judgment of the said District Court in this cause be, and the same is hereby, amended to read "without prejudice to the right of the Commission to enter a reasonable proration order and to fairly enforce it," and as so amended, that said judgment be, and it is hereby, affirmed;

It is further ordered, adjudged and decreed that the appellants, Railroad Commission of Texas, and others, and the surety on the appeal bond herein, American Surety Company of New York, be condemned, in solido, to pay the costs of this cause in this Court.

[fol. 1014]

Clerk's Certificate.

United States of America,

UNITED STATES CIRCUIT COURT OF APPEALS, FIFTH CIRCUIT

I, Oakley F. Dodd, Clerk of the United States Circuit Court of Appeals for the Fifth Circuit, do hereby certify

that the pages numbered from 1005 to 1013 next preceding this certificate contain full, true and complete copies of all the pleadings, record entries and proceedings, including the opinion of the United States Circuit Court of Appeals for the Fifth Circuit, in a certain cause in said Court, numbered 9173, wherein Railroad Commission of Texas, et al., are appellants, and Rowan & Nichols Oil Company is appellee, as full, true and complete as the originals of the same now remain in my office.

I further certify that the pages of the printed record, Volumes I. and II. numbered from 1 to 1004 are identical with the printed record upon which said cause was heard and decided in the said Circuit Court of Appeals.

In testimony whereof, I hereunto subscribe my name and affix the seal of the said United States Circuit Court of Appeals, at my office in the City of New Orleans, Louisiana, in the Fifth Circuit, this 22nd day of November, A. D. 1939.

Oakley F. Dodd, Clerk of the United States Circuit Court of Appeals, Fifth Circuit. (Seal.)

[fol. 1012] SUPREME COURT OF THE UNITED STATES

ORDER ALLOWING CERTIORARI—Filed March 11, 1940

The petition herein for a writ of certiorari to the United States Circuit Court of Appeals for the Fifth Circuit is granted.

And it is further ordered that the duly certified copy of the transcript of the proceedings below which accompanied the petition shall be treated as though filed in response to such writ.